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(54) **DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES.**

(57) The device is comprised of an unpackaging station for the unsold articles or magazines, a computer for introducing an identification code for each package of unsold articles, a first access conveyor (8) which opens into the machine (1), a second conveyor (11) for atypical articles and a third conveyor (14) for identified unsold copies, as well as an other optional conveyor (15) for extemporaneous unsold copies. A fifth conveyor (16) extends from an auxiliary station (12) to storage means with a carousel (17). The articles are fed on an inclined endless belt, passing through an optoelectronic station (25b) for identification purposes. Means for correcting the position of the papers and magazines are provided. There is provided an automatic feed device, on a unitary and continuous basis, towards the conveyor of the machine, comprised of a receiving hopper (57) with an inclined grooved bed (58), a fixed wall (59) and a movable wall which pushes the stack towards a suction cup (61) with a reciprocating motion.

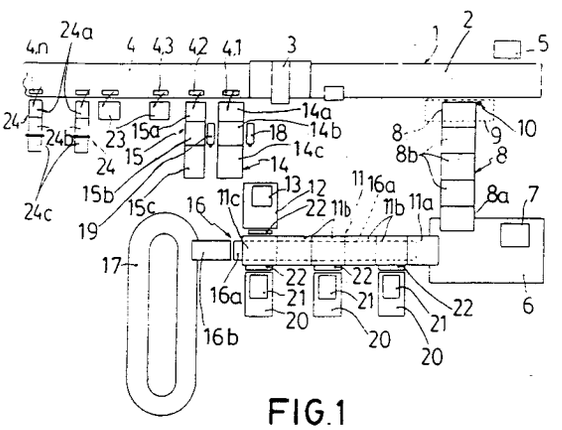

FIG.1

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OBJECT OF THE INVENTION

As is expressed in the title of this specification, the present invention refers to a device for processing the return of unsold articles, which provides a series of relevant and advantageous characteristics in this industrial sector.

FIELD OF THE INVENTION

The device that constitutes the object of the present invention is conceived as the area or platform for processing articles of a varied nature and shapes (boxes of stickers, chewing gum, trifles, big promotional cartons with recorded videos and tapes, newspapers, magazines, etc.) which is used peripherally with regard to a machine that identifies and classifies exclusively capable of processing publications such as magazines, newspapers and the like; machine whose classic example of use is by distributors of periodic publications, to control the payment of the unsold copies which are returned to it at regular intervals by the retailers.

Basically, the object of this device now proposed is to facilitate the precise, continuous and synchronized control of all the unsold articles, producing a true automatized industrial management process in which human decisions are minimal, and the manpower is optimized.

These machines preferably handle flat objects such as magazines and the like, for classification thereof which may or may not be preceded by identification of their printed covers or associated code.

Although it may be used in a more general manner, the object of the present invention is particularly destined to improve the effectiveness and functional reliability of a machine that identifies and classifies a huge amount of unsold press that has to be processed to return them to the distributor or publishing firm equipped with such a machine.

PRIOR ART

Machines with the capacity to exclusively identify and classify newspapers, magazines and the like, which have a loading area upon which the copies are classified one by one and are conveyed until they are made to pass through an identification station that explores the covers of the same, comparing them with previously "learned" models, are known in the field of this invention. After the station, the copies have access to a classification area in which there is a plurality of selective ejecting gates of the same.

The specialization of these machines upon processing the cited publications, does not allow them to adequately meet the needs of a distributor that, along with newspapers and magazines, trades in pieces of cardboard of promotional offers that include recorded tapes and video tapes, etc., articles that we will call "atypical" and that have a large variety of shapes, for example, boxes of stickers and trifles. These atypical and promotional articles may imply a considerable percentage of the total unsold articles returned to be paid, and the simple fact of having one of said machines that does not handle them only partially solves the problem of handling by the distributor.

German patent DE-899174 describes a conveyor and classification system of flat objects in which these objects are conveyed on sliding rails by means of the thrust carried out by pulling pins that are connected jointly to a motorized endless belt; it is also explained that the sliding bed is inclined transversely towards a longitudinal side of conveyance in which there is a sliding edge or section for the bottom edge of the conveyed flat object; it also explains that said conveyed flat objects may me removed or ejected through said longitudinal side of a smaller dimension, using for such purpose pushing means that act transversally to the flat object in question and that are established in correspondence with a plurality of ejecting or exit gates to which the corresponding stacking tanks are associated.

When the conveyance and classification of such flat objects is to be integrated continuously with the prior identification function, the same general concept of the machine described in said patent DE-899174 has been applied, with only the addition of an optoelectronic station known in itself capable of identifying the printed covers of said flat objects; in such a way that, these flat objects are sequentially conveyed through said optoelectronic station and later classified in terms of the verified identification. This is the case of the object comprised in U.S. patent 4.042.113, which refers to a machine expressly used to identify and classify magazines. In this U.S. patent 4.042.113 flat objects or magazines are also conveyed by pulling of an endless belt along a bed inclined towards one of the longitudinal side of conveyance, this side in which there is a sliding edge or section upon which the back of the magazines that are proportioned one by one in an initial receiving or loading area rests. In their advance movement these magazines pass through said optoelectronic station and afterwards have access to the classification section, where means that act transversally upon the magazine, separate it from the inclined conveyance bed and, by gravity, it falls selectively in one or the other of the possible multiple stacking tanks. This particular embodiment of U.S. patent 4.042.113 considers the replacement of the pulling pins by the rubbing effect of direct contact of the magazine

against the transversally inclined endless belt, in combination with some magazine proportioning means that establishes the spacing between successive magazines, as well as for the ejection of the magazines auxiliary deviating means have been included to facilitate the direction of discharge towards the corresponding stacking tank.

In this specific application to the case of magazines and other flat objects or the like, it is fundamental that the magazine is conveyed automatically and infallibly to an operative position that ensures a correct identification by the optoelectronic station and conveyance without incidences to the exit gate thereof pre-established in the classification area. The solutions provided for this purpose up to now are not fully satisfactory.

Presently numerous types of publication feeders of proportioners are known and all of them differentiate between or separate a copy from a stack of them; although in most feeders the separation is total, there are others of partial separation, in other words, each copy remains on top of another one in an overlapping manner.

A characteristic common to all of them and that is fundamental for their operation, is that all the copies of the stack to be proportioned have to be homogeneous: identical or of very similar dimensions, the same degree of flexibility, etc. Thus, the most common ones proportion the bottom most copy of the stack with an operating principle designed in some cases to take advantage of the characteristics of flexibility of the copy, in others precisely the contrary (cardboard covers), in others the thickness and rigidity of the backs, etc.

We come across some copy proportioners that may be very effective for one type of publication but contraindicated for another type and, in all cases, inapplicable for the simultaneous proportioning of two types of publications.

Another aspect to be taken into account is that at present publications have plastic wrappers that protect different gift items inside: video tapes, CDs, figurines, etc., which in general we will call "gadgets". These gadgets cause the surface of the copy not to be flat and, also to have a variable and unexpected shape. Traditional proportioners do not adapt to this circumstance.

EXPLANATION OF THE INVENTION AND ADVANTAGES

In contrast to this prior art, the novel device proposed now of a processing platform applied as a peripheral of a processing machine of typical periodic publications, is going to allow integral management of unsold ones, including atypical ones, in a precise, continuous, synchronized and automatized manner, with a minimum human participation and taking advantage of the control computer itself of the machine that is connected to the central computer (HOST) of the distributor; in such a way that, the combination of said novel processing station, machine and HOST constitute an integral management system of the return of unsold articles.

For this purpose, the new processing station device comprises:

- an unpacking station of the unsold articles to be processed;
- a computer for introducing an identification code of each package of unsold articles, that is associated to said unpacking station and connected to said control computer;
- a first conveyor of unsold publications that opens into said machine between said unpacking station and a station that proportions the copies of said publications, adjacent to said loading area of the machine;
- an end of proportioning discriminator, associated to said manual or automatic proportioning station;
- a second conveyor of atypical articles that functionally runs parallel to the machine, from said unpacking station to an auxiliary identification station attended to by an operator and located in transversal operative correspondence with the first gate of said classification area and that is to eject the unidentified copies;
- a third conveyor of unidentified copies that extends transversally to the machine from said first gate to said auxiliary station;
- an optional fourth conveyor of extemporaneous copies that extends transversally to the machine from a second gate provided for this purpose in said classification area up to said auxiliary station;
- associated to said auxiliary station and connected to said control computer, a computer processing the unsold atypical articles, of unidentified copies, and optionally, extemporaneous copies;
- a fifth conveyor that extends between said auxiliary station and some baling and storage means with a prestorage carrusel of unidentified and atypical copies for their classification by hand;
- a printer and, optionally, a printer used to assign an identification code for unidentified and extemporaneous copies that are respectively associated to said conveyors and connected to said control computer.

The new processing device thus constituted operates in the following manner:

The operator of the unpacking station receives the package of unsold copies with their return

invoice coming from a certain retailer (client); the typical copies to be processed by the machine are separated from the atypical ones; the data of the invoice are introduced into the computer of the station; the typical copies are placed in the first conveyor (transversal to the machine) and the atypical articles (with said return invoice) are placed in the second conveyor (parallel to the machine). The typical copies end up in the proportioning station, being proportioned over the loading area of the machine and after being subjected to identification, they reach the classification area where they are ejected by a predetermined gate of the multiple gates according to the program established in the control computer of the machine; the copies, that due to damage or other causes, are not identified, are ejected through the gate immediately after the identification station. Likewise, the extemporaneous copies (returned after the established and programmed period of time) will be ejected through the second gate. Said unidentified and extemporaneous copies automatically pass to the respective third and fourth conveyors that take them to an auxiliary identification station attended to by the operator, where they converge with the atypical ones that arrive by said second conveyor. The copies and atypical articles processed in this auxiliary station, are deposited in the fifth conveyor, that conveys them to the carrusel where they will be baled by hand, or to the automatic baling and final storage means. Depending on the volume of atypical articles, the existence of more auxiliary stations along the second conveyor is provided for, as described in more detail hereinafter and as is illustrated in the drawings.

In accordance with the invention, said first and second conveyors are preferably integrated by a plurality of sections provided with independent tractions and, except the first section, the other intermediate sections and the final section have associated presence sensors that detect whether or not the section is occupied by articles being processed and are connected to a unit that controls the independent tractions thereof, ordering the activation of a section when the following one is free and keeping the first section activated except when all the successive sections are occupied.

On this part, said third conveyor has three differentiated operating areas or positions: an initial or receiving position of the unidentified copies delivered by said first gate of the classification area of the machine, a center position that is occupied by the group of said copies received in the initial area when the package coming from the same has been processed, and whose center area has associated said printer that includes to said group of unidentified copies an invoice designating an identification code and a final or delivery position to said auxiliary station, which is the following feed of the conveyor is occupied by said group of unidentified copies; said conveyor being combined to said button to feed on each time that the latter is pushed; said printer being controlled by said control computer to operate each time that a group of unidentified copies occupies said center position.

Likewise, said optional fourth conveyor for extemporaneous copies has three differentiated successive operative areas or positions: one initial position receiving the copies delivered by said second gate of the classification area of the machine, a center position that, by means of a feed on a unitary basis, is occupied by the group of copies received in said initial position as coming from a specific processed package of unsold copies, and whose center position has associated said printer that includes to this group of extemporaneous copies an invoice designating an identification code, and a final position for delivery to said auxiliary station that is occupied by said group of extemporaneous copies in the following feed on a unitary basis of the conveyor; the traction of this conveyor being connected to advance one position each time that said button of the end of proportioning is pushed; and said printer being controlled by said control computer to operate each time that a group of extemporaneous copies occupies said center position.

As indicated above when there is a sufficient proportion of atypical articles, it is provided for that in at least one of the sides of said conveyor of atypical articles, there are additional auxiliary identification stations provided with corresponding additional computers and located in correspondence with one of the multiple sections of said conveyor.

As said fifth conveyor has a path coinciding with the one of the conveyor of the atypical articles, it is provided for that the first one has a bottom section that extends underneath aid conveyor and an ascending section that feeds said carrusel; with the particularity that said bottom section will extend longitudinally as required to attend to each and every one of the implanted auxiliary stations and through the respective proportioning ramps of the articles already identified in the same.

As it is inferred from what has been said up until now, the new created device carries out continuous and through processing of the entire package of unsold articles, one part autonomously by the machine itself, and the rest (atypical, unidentified and extemporaneous articles) in auxiliary identification stations attended to by an operator, but interconnected with the control computer of the machine, obtaining, in short, total management of the unsold articles.

On the other hand and in connection with the gates that for the ejection of the validated copies

the classification area of the machine has, the optional use of simple collecting drawers that store by taking advantage of the gravitational action in combination with the doubly inclined bottom, or else, the use of controlled discharge devices formed by a conveyance element that feeds a first container that, when a predetermined number of copies is reached, it is emptied automatically onto a second container from which they are taken for their baling by manual or automatic means.

The elements to be processed, designated generically as magazines, are conveyed in the handling machine, one by one by action of solidary pushing members of an endless belt and resting on a bed that is inclined towards one of the longitudinal edges thereof, in which there is a sliding section for the back of said magazines, in such a way that each magazine is proportioned on a receiving area of said inclined bed and is conveyed through an optoelectronic identification station of its cover, to end us reaching a classification or ejection area in which there is a plurality of selective discharge gates that have associated ejecting means that push the magazine transversally, separating it from the inclined bed.

In accordance with the invention effective and reliable processing of magazines is achieved making use of simple means so that naturally and automatically they are conveyed to their ideal operative position and so that the conveyance takes place without incidents. This will all improve the performance of the machine, and this is especially important when, as usual, these machines have to process huge amounts of magazines that frequently produce work overloads.

Another object of the invention is a simple and inexpensive support device of the endless belt or transversally inclined bed that facilitates replacement thereof.

In accordance with the invention, there are some first means prior to the functional entry into said optoelectronic station and that provide the automatic correction of the transversal position of the magazine, by means of its slipping by gravity over the inclined bed, until its back remains stacked on said slipping section; some second means retaining said correct transversal position of the magazine; some third means, also prior to said entry, facilitating the automatic correction of the longitudinal position of the magazine by means of its regression to the immediately posterior pushing block; some fourth means fixing the flatness of the magazine cover for its processing by said optoelectronic station; some fifth nondescending support means of said inclined endless belt; some sixth means in said ejecting area between said optoelectronic station and the selective ejection, guarantors against the overturning of the cover of the magazine; some seventh means, also in said ejection area between said station and the selective ejection, guarantors against the rolling up of the back of the magazine; some eighth ejection means of the magazine that combine the actions of two independent actuators, with double beveled edge deflecting shape and an exit ramp; and some ninth means of access to the endless belt through the inside of the frame of the machine for the assembly and maintenance thereof.

From what has been said above, in accordance with another one of the objects of the present invention, the problem of proportioning one by one previously stacked copies, when they are homogeneous and gadget-free, is adequately solved. Now then, there are cases such as for example the packages sent by selling points with the return of unsold publications, in which the copies that form said packages are completely heterogenous. When the control of the return by automatic processes is sought, by means of machines that identify the image of the cover or that read codes (bars, color, binaries, etc.) it becomes necessary to have some feeders that feed on a unitary basis the copy to the machine in question to considerably increase the yield of the same.

Therefore, the automatic feeder that may be used in the device for processing the return of unsold articles, just like the ones described above and that may also be used in other different processing installations, comply with the following specifications;

- it is capable of consecutively feeding copies of different sizes and/or consistency.
- it is capable of feeding copies with gadgets.
- it is capable of feeding homogeneous copies.
- it has synchronism elements with the conveyance system of the control machine of the return (or other type machine).
- it has interface elements with the software of the control machine of the return.

In order to achieve these privileges, the automatic feeder built in accordance with the invention, in general lines is comprised of a hopper receiving the copies to be proportioned, having an inclined and grooved bottom bed or plate, establishing the support surface of the backs. Sideways the copies are guided in a fixed reference wall and rest on a front wall that is movable and that is related to a pneumatic cylinder as we will see later on.

The entire stack of copies remains supported on the rear movable wall and the removal on a unitary basis is done by means of a vacuum suction cup, which is provided with a reciprocating motion that is controlled by an electronic device, through which a synchronism is achieved to make the forward movement coincide with the action of the suction cup, as well as the displacement of the

movable wall of the hopper in the suitable distance to guarantee the contact of the suction cup with the stack or package of unsold articles.

The existence of a separating device of the backs of the copies or magazines, formed by various elements placed in the front part of the hooper to differentiate the copy to be removed and to facilitate the proportioning thereof, has also been provided for.

With regard to the vacuum suction cup, we can emphasize the fact that its structure is formed by a frame connected to the depressor, having an outside grating that enters into contact with the copy to start the suction in a homogeneous manner, optimized by the existence of an elastic tongue that surrounds the suction cup.

Elements that compensate for the deformation of the stack of copies, in the common case when the backs of the same have the tendency to slide towards the front part of the grooved plate of the hopper, thus leaving the stack with its base wider than the top part, are provided for. This fact is frequent with stacks of a large number of copies, but also when there are few and they are damaged in this sense. In order to avoid this, the automatic feeder includes in the movable plate itself a pushing plate that is adapted to the stack of copies with the help of a pneumatic cylinder.

When the last copy of the stack placed in the hopper has been removed, a sensor detects it and orders the back motion of the movable plate to its initial position previously programmed in accordance with the size of the stacks that are waiting to be processed.

An electronic device, based on a PLC or on a microprocessor plate or the like, carries out the control of all the movements required by the automatic feeder. By means of control software the state of the different sensors is analyzed so that, from the conditions imposed on the same, the corresponding electric valves that trigger the movements of the pneumatic cylinders responsible for the movements are activated.

The automatic feeder that the invention considers, is especially applicable in proportioning copies with which the automatic machines are fed for the control of the return of unsold publications. These automatic feeders considerably improve the performance of said automatic machines. Inside the loading process of copies the following aspects will have to be taken into account:

- the return of unsold copies either organized by packages, each one identified by a code indicating its origin.
- each return package is formed by heterogenous copies mixed together.
- the machine controlling the return has to be loaded with copies in a separate manner on a unitary basis, so that the reading system can identify each copy.
- prior to the loading of the copies of a package it is necessary to report to the machine controlling the return the identification code of the package so that it relates its contents with its origin or sender.
- it is normal that the conveyance system of the machines controlling the return has some elements that push or pull each copy. Therefore, the proportioning has to be done in the space between two pushers, which means that there must be synchronization between the load and the conveying element.

Among other characteristics we could cite that which provides for the change of the code of the package to be processed, due to a change of the client. There is communication by electronic means between the control system of the feeders and of the machine controlling the return. The latter is the one that knows the codes of the different packages. Therefore, upon receiving, from the feeders, an electric signal, each time that the last copy is ejected from a feeder, the machine controlling the return carries out the corresponding package code change, to assign the corresponding code to the next copy.

The separation between the last copy of a feeder and the first one of the following one can be programmed in terms of the process that the machine controlling the return uses to carry out the code change. The starting order to each feeder is done from the machine controlling the return by means of the same electronic communication.

In this special use of the automatic feeders, two of them are used, the operator being located between the two. When the two feeders are unloaded and the machine controlling the return has the package codes corresponding to each one, a pilot light next to the feeder that first has to be loaded lights up, so that there is no loss of sequence.

Each feeder has a sensor that is activated with the passing of the pushing blocks of the conveyance system of the machine controlling the return, so that the copy removal mechanism is synchronized with the passing of the cited pushing block.

In order to provide a better understanding of the characteristics of the invention and forming an integral part of this specification, some sheets of drawings in whose figures, in an illustrative and non-restrictive manner the following has been represented, are attached hereto:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a plan view that schematically shows the device for processing the return of un-

sold articles, especially applicable to a machine identifying and classifying newspapers, magazines and the like.

Figure 2 is a perspective view of a machine identifying and classifying magazines in accordance with the invention, including all the proposed improvements except the covering section of the supports, the grate and the outlet trays, which are seen more clearly in subsequent figures.

Figure 3 is a raised schematic view of the machine from its final conveyance end.

Figure 4 amply shows detail A of figure 2, with the particularity that the optoelectronic station appears silhoutted in a broken line.

Figure 5 is a partial longitudinal section that schematically shows the concealable lift, the holding strip with its grip regulating device, the strip against transversal rolling up of the back, the pressing strips and the air curtain.

Figure 6 is a raised section similar to figure 3, but referred to the arrangement of the endless belt and its hanging support, and showing the practicability of the collapsible section of the legs whose height can be adjusted.

Figure 7 is an enlarged view of detail B of figure 6.

Figure 8 is an enlarged view of detail C or figure 6.

Figure 9 is a view similar to figure 6, but partial and referred to the top half of the endless belt, after now including the covering section and the grate against overturning.

Figure 10 is a partial view of the classification area, which shows in perspective the arrangement of the grate against overturning.

Figure 11 is a partial view of the classification area, but referred exclusively to the selective ejection device of the magazines.

Figure 12 is a view similar to figure 9, now referred to two holding flanges, some upstream in the retracted position and some downstream in the holding position.

Figures 13 and 14 are schematic views corresponding to the cross section of figure 11, showing the operative ejection action, figure 13 representing the holding position or non-ejection position and figure 14 representing the ejection position.

Figure 15 is a perspective view of an automatic feeder that can be coupled to the handling and classifying machine, in accordance with the device for processing the return of unsold articles, object of the invention.

Figure 16 is a raised side view of that which is shown in figure 15.

Figure 17 is a perspective view of that which is shown in figure 15.

Figure 18 is a partial view of the pusher of the automatic feeder.

Figure 19 is a cross section of that which has been shown in figure 18.

Figure 20 is a perspective view of a double automatic feeder, to allow the operator who loads, to locate himself between them in order to have access to the loading hoppers on the right and on the left.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Making reference to the numbering used in the figures, we can see how the device for processing the return of unsold articles, that the invention proposes, allows integral management of unsold articles and it is schematically represented in figure 1, applied to a machine for identifying and classifying magazines, newspapers and the like, that is controlled by the computer (5) connected to the central one (HOST) of the user (distributor that must handle the returned unsold articles, in order to pay the retailer); and whose machine (1) also comprises the loading area (2) upon which the copies are to be proportioned by hand or automatically, station (3) for identifying the same and the classification area (4) provided with a first ejecting gate (4.1) for the unidentified copies, a second gate (4.2) for the extemporaneous copies, a plurality of gates (4.3 to 4.n) for the selective ejection of the copies that have been identified by the machine and that are also within the return period (validated copies).

Structurally and functionally the proposed device consists of the following:

The package of unsold goods of each retailer is taken apart in each unpacking station, separating the publication copies from the atypical articles. The data identifying the return invoice and each package of unsold articles are introduced in the computer (7) (by the keyboard, car code, etc.), which are passed to the computer (5) at the moment in which the effective processing thereof is going to take place. The copies are placed in the initial section (8a) of the conveyor and the atypical articles are placed in the final section (11a) of the conveyor (11). Two successive packages can have the same identification and in the processing a stack of codes is created in this computer (7) so that the higher one is that of the package closest to the machine (1) (or station 12). When the discriminator (10) operates the first recording of the stack passes to the computer (5) so that upon starting a new proportioning the data are already in the machine without keying them in.

Conveyors (8) and (11) are integrated by several sections (8a, 8b, 8c) and (11a, 11b, 11c) of the continous band type operable independently and provided (except the first one 8a and 11a) of pres-

ence sensors (barrier photocell) and an electronic control (PLC), so that each section (8b, 8c) and (11b, 11c) advances as long as the preceding one is not occupied and so that the first section (8a and 11a) is also operating except if the other ones (8b, 8c) and (11b, 11c) are already occupied. In this way, empty spaces between two successive packages, idle time of the operators waiting for the package are eliminated and, at the same time, it is achieved that the sections closest to the machine (1), like the auxiliary station (12) are always occupied. In order to avoid the sliding of the packages, the strip has a highly adherent surface; and to ensure good continuity between the successive sections, the driving and loose rollers have a small diameter.

When the copies reach the proportioning station (9), the indicative date introduced in the computer (7) have already passed to the computer (5) of the machine (1), fruit of prior pushing of the button (10) at the end of the proportioning of the preceding package. Then, proportioning, one by one, of the copies on the loading area of the machine goes on. After the proportioning of the package finishes, said discriminator (10) operates with which the jump of the code corresponding to the following package to be proportioned into the machine (1) and to be processed in the rest of the installation is produced.

At the right time, the atypical articles progress along the conveyor (11) until they reach the auxiliary station (12), where they arrive along with the retailer's invoice so that the operator introduces (by keyboard, bar code, etc.) the corresponding code in its computer (13). When significant volumes of atypical articles are expected additional auxiliary stations (20) and corresponding computers (21) are implanted, preferably at the outside side of the circuit formed, although it is also possible at the inside side, which will operate at their own rate.

Unidentified and extemporaneous articles also converge in said auxiliary station (12) for their processing. The conveyance is, respectively, carried out by conveyors (14) and (15), which have the same function consisting in their span being subdivided into three positions, initial (14a, 15a), center (14b, 15b) and final (14c, 15c) which are successively occupied by copies being processed. In the initial position (14a, 15a), the copies coming from a package of unsold articles are accumulated until, with the operation of the discriminator (10), it is first produced that the conveyors (14, 15) advance one position making the copies (unidentified and extemporaneous) occupy the center position (14b, 15b); secondly, the computer of the machine (1) reports the package code to the printer (18, 19) and thirdly, the printer (18, 19) issues a ticket with said code and includes it in the group of copies. In the following feedthe copies will reach the final position (14c, 15c) in which they are in a position to be processed in said auxiliary station (12).

The copies processed by hand in the auxiliary station (12) (and in the same way in stations (20)) are proportioned through the ramps (22) upon the bottom section (16a) of the conveyour (that runs under the conveyor (11) in order to continue along the ascending section (16b) which in this case, delivers them on the carrusel (17) where they wait to be classified, baled by hand and stored, but they can likewise be delivered to an automatic baling and storage line.

As to the identified copies, they are selectively ejected through the gates (4.3 to 4.n) of said classification area (4). The collection may take place in simple drawers (23) with a doubly inclined bottom that favors automatic arranging of the copies; or else, in controlled unloading devices (24) formed by a conveyor element (24a) (of a preferably inclined bed to favor said arrangement) that places the copies in the first container (24b) until a predetermined amount is accumulated, when they are automatically passed to the second container (24c), where they will be collected for baling and storage thereof.

It is provided for that the auxiliary computers (13) and (21) pass on their processed data to the computer in the execution of a single global document of the total return of a client.

Obviously, the performance of the device is capable of partial execution and for example, if the user does not need to differentiate atypical articles, this part of the device may be eliminated.

Now making special reference to figures 2 to 14, the magazines (55) are fed one by one on the withdrawal area (25a) of the endless belt (26) inclined transversally, striving to have them fall between two successive transversal blocks (32), but without taking too much care, hence, it must be provided for that the backs (55a) do not remain from the beginning supported on the slinding section (28) and that the magazines (55) remain turned and separated from said section (28), even astride the transversal position of one of said blocks (32). In such unarranged positions it is not possible for the optoelectronic station (25b) to carry out its function of identifying the covers of the magazines (55), but rather the ideal position for this purpose has to be that the magazine (55) travels with the back perfectly supported on the sliding rail (28) and in a flat state so that the cover can be correctly "read".

The above mentioned first, second, third and fourth means characterized by this invention (figures 2 and 4 to 6) have this purpose.

Hence, said first means, which correct the transversal position of the magazine (55) on the in-

clined bed of the endless belt (26), consist of: this endless belt (26) having its surface slippery; the pushing members (32) solid with said enless belt (26) being transversal blocks (32) that have the particularity that they only extend on a narrow bottom strip whose width is aproximately one part of the width of the endless belt (26), as well as these blocks (32) having on their top surface a beveled edge (32a) which in the top end thereof originates at the level of the surface of the endless belt (26) and extends to approximately the center of said top surface of the block (32). And there are devices that eliminate the static electricity from the surface of the endless belt (26), distributed along the length thereof. In other words, all of this has the purpose of facilitating sliding by gravity of the magazine (55) until its back (55a) remains backed up against said section (28). The blocks (32) that, due to their minimum length and beveled edge, not only favor said slipping but they also permit the return of the endless belt (26) to be verified (figure 6) on rollers (31) that only need to be cut down in a short section of its length, which is tremendouslyadvantegous (it permits, for example, the existence of tightening rollers) against the hypothetical case of transversal block all along the width of the endless belt (26), deserve special mention.

As to said second retaining means of the correct transversal position of the magazine (55), they consist of a strip (37) located between the slipping section (28) and the bottom edge of the endless belt (26), in order to prevent the transversal sliding of the magazines due to downward slipping of the back (55a).

And with regard to said third means correcting the longitudinal position of the magazine (55) on the inclined bed (26) they are overlapped longitudinally over said strip (37) and they are operatively located between the sliding section (28) and the beginning of the belt (26) and they are the following: a concealable lift device (34) of the back (55a) of the magazines (55) that is normally sticking out due to the resisting action of a spring (34a) that elastically gives in due to the weight of the magazine (55), facilitating a combined action of the effects of friction and gravity that causes the automatic regression of the magazine copy (55); a vacuum suction cup (34) of Venturi effect that brakes the feed of the magazine (55) until it is reached by the bevel-edged block (32) that follows it; and a retaining strip (36) that has an intensity adjustment device (36a) and that acts upon the back (55a) of the magazine (55) in a previous and overlapped manner under the start of said strip (37) braking the feed of the magazine (55) due to the increase of the friction, until the pusher or bevel-edged block (32) reaches it.

The securing of the flatness of the cover of the magazines (55) prevents incorrect reading of the cover if the cover remains lifted due to damage of the copy. Due to defective proportioning, or due to air tubulence, and this flatness is achieved by said fourth means, that consist of: a fin (38) overturning said cover; a blower (39) with adjustable intensity that is located after said fin against overturning (38), directed obliquely over the cover and activated by a sensor that detects the beginning of a new copy; an air curtain (40) that extends transversally along the entire width of the endless belt (26) has an adjustable intensity and is located after said oblique blower (39) producing a continous air flow inclined in the feed direction of the copy; and some pressing strips (41) that are located after said air curtain (40) and are applied on the cover in its feed through said electronic station (25b). The overturning fin (38) is abutted to the sliding section (28) of the back (55a) and is long and high enough to return to its natural position, covers shich circulated completely open, even flying over said sliding section (28). The oblique blower (39) acts on the convers that try to rise the overturning fin (38) being already overcome, and it is activated by an electric signal that comes from said sensor.

Given the transversal incline of the endless belt (26), in order to efficiently counteract its tendency to drop, in accordance with the invention said fifth means, which consist of, all along the top edge of said endless belt (26), a longitudinal block (27) being fastened, whose bottom surface remains applied by both the visible and the hidden surfaces of the endless belt (26) upon a plurality of bearings (43) supported in respective supports (42) anchored upon the fixed frame of the machine itself (25), are provided for. This support device is to be hidden by a covering section (44) which will be discussed later on, upon dealing with the grate against overturning (46) of the cover.

At the exit of the optoelectronic station (25b) one enters into the classification area (25c), where the magazines (55) are to be kept circulating in the correct position and without interference of stops.

In this sense, on the one hand it is to be avoided that due to air turbulence, or defects of form, the covers are overturned over the slinding section (28), overrruning it, since they would come up against the outlet trays (52) and would interfere with the normal flow, producing serious malfunctioning in the processing of the unsold magazines (55).

To this effect, there are said sixth means, that consist of a grating (46) workable by tilting that is formed by crossbars (46b) that longitudinally extend over the endless belt (26) not very high up, adjustable with regard to said cover, and by projecting crosspieces (46a) whose feet are jointed to the

static frame of the machine (25) by means of the corresponding tilting shafts (47). It is provided for that said tilting shafts (47) of the grating (46) are located on a section (44) covering said support means (27, 42, 43) against the drop of the endless belt (26) that correspond to the visible surface of the belt, whose covering section (44) is provided with corresponding supports (45) with regard to said supports (42). On the other hand, it is to be avoided that those copies in which the back (55a) rolls up can slide and exceed the sliding section (28); for this purpose, said seventh means against the rolling up of the back (55a) of the magazine (55) consist of: all along the sliding section (28) in said ejection area (25c), there are withdrawable holding flanges (50), placed one after the other and each one linked to an exit gate (52) whose holding flanges (50) are operatively projected towards the center of the inclined bed (26), remaining overturned over the path of the back (55a), alding over said sliding section (28).

Because this holding flange 50 must be withdrawn to check the voluntary ejection of the magazine 55, this eighth means of ejection of the magazine 55 consists of: an ejector shovel 48 in the active part of which there are longitudinal beveled edges 48a, and at the posterior end or upstream, and transversal 48b, on the side turned towards the center of the endless belt 26, a first actuator 49 of that ejector shovel 48 between a non-active concealable position and an active protruding position which notably reaches the limit level of that slipping section 28; a second actuator 51, of combined action with that first actuator 49 and that is associated with this withdrawable holding flange 50 operating between that active protruding position and a withdrawn ejection position of the magazine 55. To avoid a place being formed when a flange 46 is withdrawn downstream, where there could be an accidental tangle where the copy comes out, these withdrawable holding flanges 50 have a triangular expansion complement 50a of their turned end and the protruding crown of this complement 50a is left keeping the continuity according to the retaining projection of the next flange 50 downstream. The action of these actuators (49, 51) is combined (figures 13 and 14) so that the flange 46 is withdrawn when checking the emergence of the ejector shovel 48.

To facilitate the emergence of the ejected copy, the outlet tray 52 corresponding to the next outlet tray or door 28 downstream, is extended at the rear in a deflector plate 54 in a downward ramp.

To facilitate the sliding movement of the ejected magazines 55 on the outlet trays 52, these trays 52 have ball bearings 53 locked in their bed.

The invention foresees an easy access to the endless belt 26 from inside the frame of the machine 25, for the purpose of assembly and maintenance jobs. This ninth means is accordingly provided for which consists of the legs 29 which hold up the machine, 29, whose height can be adjusted and have at the uppermost side a colllapsible section 30 which surrounds that access.

Because the identification readings of the copy or object that have been described contain optoelectronic means associated with the identification of the printed image, they can be complemented and/or replaced by code reader means associated with each copy or object (bar codes, magnetic signals, photosensitive impressions, electromagnetic signals, etc.).

Referring now to figure 15 to 20 we can observe the preferred form of embodiment for an automatic feeder which can be used on the machine in accordance with the device for processing the return of unsold articles, and which can also be used for another different machine and processing, because it is an independent element which can be easily included or nut included in an installation, as we will see below. The automatic feeder has the general reference number 56.

This automatic feeder 56 has a hopper 57 defined by a grooved bed 58, a fixed wall 59 and a movable wall 60. The copies will be deposited with their backs supported on the grooved bed 58 and referenced against the fixed wall 59. Because the groove bed has a gradient of 35º, the entire stack of copies will lean against the posterior movable wall 60.

The copies will be removed from the front of the hopper 57 by a vacuum suction cap 61. This cap will be located opposite the angle formed by the grooved bed 58 and the fixed wall 57.

Because it lies near the fixed wall, one hundred per cent of the suction cap is guaranteed to lie above the copy that is to be removed, irrespective of its size, so that no two are removed at the same time. Because it lies near the edge of the grooved bed, the copy can be grasped at its most consisted part, namely, near its back.

The ejector suction pad has a reciprocating movement so that when it stands in a feed position, it sucks the copy, during the backward motion it ejects it and when it reaches its most backward position, the suction ends and it drops by gravity. This suction cap 61 contains a device which detects whether the copy has or has not been grasped, and the re-try will then begin before it reaches the end of its backward run. The entire reciprocating motion is controlled by an electronic synchronism device which causes the moment when the copy is dropped on the conveyor belt 62 to coincide in the suitable place and time.

Whilst the ejection device is working, the movable wall 60 reaches the appropriate distance to guarantee that the copy that is to be ejected is in an optimum position to be removed by the suction cap 61. When the last copy has been proportioned, this wall automatically returns to the initial position, to allow the hopper 57 to be loaded anew.

The back separator device, which has the general reference number 63 and which is can be clearly observed in figure 17, is made up of the fluted section 64, a lateral air flow device 65, and spacer strips 66.

The fluted section 64 is fitted right at the edge of the grooved bed. Its special section with two curvature radii retain the backs of the copies (especially those which are bent forwards), until the suction cap overcomes this resistance to remove them.

The air ejector device 65 sends air at pressure from the bottom of the fixed wall 59 and near the fluted section 64, preventing any possible approximation of the back of the next copy that is to be ejected.

The posterior end of the spacer strips 66 is secured by a fastening to the grooved bed 58 and the other end is raised to form an angle of 90º with the rest of the strip. They allow a copy to pass when the whole stack is pushed by the movable wall 60 and prevent the first two copies from coming together, when the suction cap pushes the first of them to grasp it.

The automatic feeder 56 includes a device for removing the copy, which has the general reference number 67, made up of the following elements:

- vacuum suction cap 61. This element performs the approximation, contact, suction, removal and drops the copy. It is made up of a frame 68 which holds the tube 69 (see figure 16), and the outer grate 70 which produces the suction of the copy when it comes into contact with this.

  The particular concave shape of the grate 70 produces a homogeneous and very ample depression area around the center of the grate (that enters into contact with the copy) and to the tongue 71 that surrounds the suction cap. Thanks to this particular shape of the grate 70 an optimum suction is obtained for articles of these characteristics (copies with or without gadget).

  There are two claws 72 (see figure 15) which are secured jointly to the bottom of the suction cap 61 (see figure 15) and which are fed in respect of the plane of grate 70, which have the effect of pushing the back of the copy that is to be removed against the strips 66; this effect is particularly important in those cases where the backs are bent forward.

  Making special reference now to figure 16, we can observe here how the mechanisms are schematically shown for the reciprocating motion of the suction cap 61. This is achieved with the help of a pneumatic cylinder 73 whose rod transmits its motion to a sliding tube 74, via the handle 75 whose rotation point is at the lower end 76.

  This sliding tube 74 works as switch of the vacuum of conduit 69, thanks to a mechanism 77 which has a pressure compensation chamber to prevent the sliding tube 74 from suffering dominant forces which increase its friction on the slip guides. This can be schematically be seen in figure 16.

- detection of grasped copy. When the sliding tube 74 moves backwards, the suction cap 61 comes up to the copy and at a given point in its run, it switches the suction from conduit 69 towards the grate. At the same time, the suction cap 61 advances until the sensor 78 (see figure 15) is activated by effect of the action of the suction cap on the copy. It is then that the sliding tube 74 reverses its movement when the rod of the cylinder 73 moves forward. At a given point in the run of this advance moment, the grate 70 loses the suction effect and the copy drops by gravity.
- Try-again handling. When suction cap 61 has grasped the copy and withdraws with it in suction, sensor 78 must remain activated. When the backward movement starts and this sensor is deactivated, this means that the copy has not been grasped, and straight away and automatically the handling will be retried without waiting for the suction cap to complete the backward motion cycle.
- Surplus anti-suction checks. This is a structure in the shape of an inverted "U", whose plane is slightly more advanced than the plane of the grate of the suction cap when this is fully withdrawn. These checks then detach the copy from the suction cap when there is any surplus suction, even though the vacuum has been eliminated, as we can deduce when observing figure 15.
- Synchronism elements in the withdrawal. These are defined by electronic control elements, which apart from co-ordinating and governing the entire process, direct the action of the pneumatic cylinder via its electrovalve. The response of the suction pad to the cylinder movement is thus controlled and allows it to synchronize with events external to the feeder, which will enable it to proportion each copy at the suitable time and place.

As the suction cap removes copies from the front of the hopper, the whole stack that is stored in the hopper must be pushed to guarantee that there is always a copy on the edge, ready for ejection. The device to shift the complete stack of copies consists of different elements which are described below:

- movable wall. The complete stack of copies rests on the movable wall 60, which moves along the ruts of the grooved plate 58 by the action of the cylinder 80, as we can observe from figure 15. The movement of the cylinder 80 in turn responds to the deactivation of another sensor 79 fitted on the grooved plate, and partly introduced in the fluted section 64. When the sensor is deactivated, this indicates that the copy has now been ejected and cylinder 80 must be worked until another copy is left ready; this happens when sensor 79 again becomes activated.
- Elements which compensate the deformation of the stack. As we have seen above and to prevent the backs of the copies of the stack from bending forwards, there are two elements on the same movable plate 60. On the one hand, a pusher plate 81 (see figure 15) which is what is really in touch with the stack. The special shape of this plate corrects the deformation effect. To help this correction even more, it has been arranged that part of this plate is movable by means of the action of a pneumatic cylinder. This pneumatic cylinder moves forward when there is more than one try again handling.
- backward movement of the movable wall. A sensor which is joined to the pusher plate 81 shows when the last copy has been removed from the stack. This is when cylinder 80 makes the plate move back to its initial position. This initial position has been programmed previously by switch 82 so that the cylinder can move back completely, or only to half its run, depending on the size of the stacks which are waiting to be loaded, with the consequent optimization in dead time.

Referring now in particular to figures 18 and 19, we can see the mechanism in them of how the ejected copy is collected. Because in the last instance, the ejected copy drops by gravity, and considering the heterogeneous nature of the copies in question, whose sizes, consistencies, thicknesses and positions of their centers of gravity are different, the contact between the back of the copy and the sliding section of the return control machine is not expected to occur simultaneously at all its points of contact. To obtain a good contact between copy and section, the ejected copy collector mechanism is used, which is made up in this preferred embodiment example by the following elements:

- back conditioner. The tilting plate 83 prevents copies whose backs have an important thickness, from remaining jammed in the displacement section 84 and cannot be conveyed by sliding.

  Furthermore, nozzle 85 projects air at pressure so that the backs that are bent upwards adjust to the conveyor cover 86 of the return control machine and contact with the displacement section 84 when slips down.
- shock absorber. The displacement section 84 is interrupted in the collector mechanism area. This new section, which has reference 87 is not directly attached to the return control machine, as in the ase of section 84, but is joined by a simple shock absorber mechanism that consists of two pneumatic cylinders 88 whose rods are joined to the section 87 by an elastic transmission 89.

In figure 20 we can see a perspective view of the embodiment of the two feeders for the proportioner application of copies to the control machine of return of unsold publications. One of these automatic feeders will be the specular image of the other and which will allow the operator who loads, to locate himself between them in order to have access to the loading hoppers on the right and on the left.

The operation is as follows: the operator loads a package on each of the automatic feeders 56 and presses the button "ready" 90 (also see figure 15). The control system receives the package code. The feeder starts proportioning. The operator loads the other automatic feeder 56 with the next package and presses the button "ready" 90. The control system receives this package code. When the last copy is proportioned from the first feeder, the second one starts automatically. The operator loads the first feeder 56, and the cycle is again repeated.

Claims

1. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in particular a spring device or area for processing unsold articles, annex or peripheral of a machine (1) for recognition and classification of unsold publications that consists basically of a loading area (2) on which the copies are proportioned, an identification station (3) that identifies the covers of the copies, a classification area (4) that sorts out the copies for identification, and a control computer (5) of the machine (1) that is connected to the user's central computer,

characterized because the spring device of the process includes:

- an unpacking station (6) of the unsold articles for processing:
- a computer (7) for introducing an identification code of each package of unsold articles, which is associated with the unpacking station (6) and connected to the control computer (5);
- a first conveyor (8) of unsold publications which pass to this machine (1) between the unpacking station and a proportioner station of the copies of those publications, adjacent to the load area (2) of the machine (1),
- a discriminator (10) for proportioning, associated with this manual or automatic proportioned station (9):
- a second conveyor (11) of atypical articles that are passed in parallel operation to the machine (1), from this unpacking station (6) to an auxiliary operator-assisted identification station (12) and located in transverse operation with the first gate (4.1) of that classification area (4) and which ejects the unidentified copies;
- a third conveyor (14) of unidentified copies which extends transversely to the machine (1) from that first gate (4.1) to the auxiliary gate (12).
- An optional conveyance room (15) of extemporaneous copies which extends transversely to the machine (1) from a second gate (4.2) that is provided for this purpose in the classification area (4) to the auxiliary station (12);
- associated with this auxiliary station (12) and connected with this control computer (5), a computer (13) for processing atypical unsold articles, unidentified copies and, as an option, extemporaneous copies;
- a fifth conveyor (16) which extends between this auxiliary station (12) and baling and storage means with a carrousel (17) for pre-storage of unidentified and atypical articles for their classification by hand;
- a printer (18) and as an option, a printer (19) designed to assign identification code for unidentified and extemporaneous articles, which are respectively associated with that conveyor (14 and 15) and connected to this control computer (5).

2. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claim, characterized because this conveyor (8) is preferably formed by a plurality of sections (8a, 8b, 8c) which have independent traction and, except for the first section (8a) the other intermediary sections (8b) and the final section (8c) have associated presence detectors which detect whether or not the section is occupied by articles that are being processed (8b, 8c) and are connected to a unit which controls their independent traction, arranging the activation of a section (8b) when the next one (8b or 8c) is free and keeping the first section (8c) activated except when all the successive sections (8b and 8c) are occupied.

3. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because this conveyor (11) is preferably formed by a multiplicity of sections (11a, 11b, 11c) which are fitted with independent traction which, except for the initial section (11a), the other intermediary sections (11b) and end section (11c) include presence sensors which warn whether or not each section (11b, 11c) is occupied by articles being processed and are operatively combined with a unit which controls these independent tractions provoking the activation of a section (11b) when in the next section (11b or 11c) there is no presence of articles being processed and keeping this initial section (11c) permanently activated, except when all the successive sections (11b, 11c) are already occupied by those articles.

4. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because this conveyor (14) has three different areas or operative stations: an initial position (14a) or a reception gate (4.1) in the classification area (4) of the machine (1), a central station (14b) which is occupied by the group of these copies that are received in the initial area (14b) when the package which comes from here has been processed, and whose central area has this printer (18) associated with it which embodies in this group of unidentified articles, a invoice that assigns the identification code, and a final station (14c) or delivery to this auxiliary station (12), which in the next feed movement of the conveyor (14) is occupied by this group of unidentified articles; this conveyor (14) is combined with this discriminator (10) to advance one station each time this (10) is activated; and where this printer (18) is governed by this control computer (5)which will operate each time a group of unidentified articles oc-

cupy this central station (14b).

5. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because this optional conveyor (15) for extemporaneous copies, has three different successive areas or operative stations: an initial position (15a) to receive the copies that are delivered by this second gate (4.2), from the classification area (4) of the machine (1), a central station (15b) which, by a unit feed, is occupied by the group of copies received at that initial position (15a) from a given processed package of unsold articles, and whose central station (15b) has this printer (19) associated which embodies in this group of unidentified articles, a invoice that assigns the identification code, and a final delivery station (15c) to this auxiliary station (12), which in the next unit feed movement of the conveyor (15) is occupied by this group of unidentified articles; the traction of this conveyor (15) is connected to advance one position each time this discriminator (10) operates for proportioned purposes; and where this printer (19) is governed by this control computer (5) to operate every time a group of extemporaneous articles occupy this central station (15b).

6. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because it is provided for that on at least one side of this conveyor of atypical articles (11) there are additional auxiliary identification stations (20), with their respective additional computers (21) and located in correspondence with one of the multiple sections (11a, 11b, 11c) of this conveyor (11).

7. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because it is provided for that this conveyor (16) consists of a bottom section (16a) which extends underneath this conveyor (11) and an upward section (16b) which feeds this carrousel (17).

8. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because it is provided for that this auxiliary station (12) and these additional auxiliary stations (20) are related with this bottom section (16a) of the conveyor (16) via respective proportioned ramps (22).

9. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because in respect of the gates (4.3 to 4.n) which the classification area (4) of the machine (1) has to eject validated copies, the optional use of simple collecting drawers (23) is provided for that store by taking advantage of the gravitational action in combination with the doubly inclined bottom, or else the use of controlled (24) discharge devices formed by a conveyance element (24a) that feeds a first container (24b) and when a predetermined number of copies are reached, is automatically emptied onto a second container (24c) from which they are taken for their baling by manual or automatic means.

10. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the claim 9, characterized because this conveyor element (24a) has its bed inclined in respect of the horizontal plane in favoring the perfect order of the automatic stacking of the copies of the bale that is formed.

11. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claims, characterized because it is provided for that the auxiliary computers (13 and 21) pass on their processed data to the computer (5) in the execution of a single global document of the total return of a client.

12. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in particular for machines (25) that handle unsold press and other assimilable flat objects, which are in future given the generic name of magazines (55), and on whose machines (25) these magazines (55) are transferred one by one by the action of joint pusher members (32) of an endless belt (26) and resting on a bed which is inclined towards one of the longitudinal edges, where there is a slipping section (28) for the back (55a) of these magazines (55) so that each magazine (55) is proportioned on a reception area (25a) of this inclined bed (26) and is conveyed by an opto-electronic station (25b) for idensification, to end up in a classification or ejection (25c) area where there is a plurality of selective discharge gates (52) which have associated ejecting means that push the magazine (55) transversally separating it from the inclined bed (26), characterized because it has the peculiar feature of including some first means prior to the functional entry into said opto-electronic station (25b) and that provide

the automatic correction of the transversal position of the magazine (55) by means of its sliding by gravity on the inclined bed (26), until its back (55a) remains stacked on said slipping section (28); some second means retaining said correct transversal position of the magazine (55); some third means, also prior to said entry, facilitating the automatic correction of the longitudinal position of the magazine (55) by means of its regressionto the immediately posterior pushing block (32); some fourth means fixing the flatness of the magazine cover (55) for its processing by said opto-electronic station (25b); some fifth nondescending support means of said inclined endless belt (26); some sixth means in said ejecting area (25c) between said opto-electronic station (25b) and the selective ejection, guarantors against the overturning of the cover of the magazine (55); some seventh means, also in that ejection area (25c) between said station (25b) and the selective ejection, guarantors against the rolling up of the back of the magazine (55); some eighth ejection of the magazine (55) that combine the actions of two independent actuators, with double beveled edge deflecting shape and an exit ramp; and some ninth means of access to the endless belt (26) through the inside of the frame of the machine (25) for the assembly and maintenance thereof.

13. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with the above claim, characterized because these first corrector measures of the transversal position of the magazine (55) on the inclined bed of the endless belt (26) consist of: this endless belt (26) has a sliding surface; the pusher members (32) are joined to this endless belt (26) and are transversal blocks which have the peculiarity that they only extend in a narrow bottom strip that has a width of approximately one fourth the width of the endless belt (26), and also that these blocks (32) have a beveled edge (32a) at the top surface which in the top end thereof originates at the level of the surface of the endless belt (26) and extends to approximately the center of said top surface of the block (32); and there are devices that eliminate the static electricity from the surface of the endless belt (26), distributed along the length thereof.

14. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 and 13, characterized because these second retainer means of the correct transversal position of the magazine (55) consist of a strip (37) located between the slipping section (28) and the bottom edge of the endless belt (26), in order to prevent the transversal sliding of the magazines caused by the back sliding down (55a).

15. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 14, characterized because these third corrector means for the longitudinal position of the magazine (55) on the inclined bed (26) are overlapped longitudinally over said strip (37) and they are operatively located between the slipping section (28) and the beginning of the belt (26) and are the following: a concealable lifting device (34) of the back (55a) of the magazines (55) that is normally sticking out due to the resisting action of a spring (34a) that elastically gives in due to the weight of the magazine (55), facilitating a combined action of the effects of friction and gravity that causes the automatic regression of the magazine copy (55); a vacuum suction cup (35), of Venturi effect that brakes the feed of the magazine (55) until it is reached by the bevel-edged block (32) that follows it; and a retaining strip (36) that has an intensity adjustment device (36a) and that acts upon the back (55a) of the magazine (55) in a previous and overlapped manner under the start of said strip (37) braking the feed of the magazine (55) due to the increase of the friction, until the pusher or bevel-edged block (8) reaches it.

16. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 15, characterized because this fourth means of fixing the flatness of the cover of the magazine (55) is formed by a fin against overturning (38) said cover; a blower (39) that has an adjustable intensity and is located after the said fin against overturning (38) and directed obliquely over the cover and activated by a sensor that detects the beginning of a new copy; an air curtain (40) that extends transversely along the entire width of the endless belt (26) has an adjustable intensity and is located after said oblique blower (39) producing a continuous air flow inclined in the feed direction of the copy; and some pressing strips (41) that are located after said air curtain (40) and are applied on the cover in its feed through said opto-electronic station (25b).

17. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 16, characterized because this

fifth means to efficiently counteract the tendency of the endless belt (26) to drop, consists of, all along the top edge of said endless belt (26), a longitudinal block (27) is fastened, whose bottom surface remains applied by both the visible and the hidden surfaces of the endless belt (26) upon a plurality of bearings (43) supported in respective supports (42) anchored upon the fixed frame of the machine itself (25).

18. DEVICE FOR THE PROCESSING OF THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 17, characterized because this sixth means of avoiding the overturning of the cover of the magazine (55), that consists of a grading (46) workable by tilting that is formed by crossbars (46b) that longitudinally extend over the endless belt (26) not very high up, adjustable with regard to said cover, and by projecting crosspieces (46a) whose feet are jointed to the static frame of the machine (25) by means of the corresponding tilting shafts (47).

19. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 18, characterized because this seventh means to avoid the back (55a) of the magazine (55) from rolling up, consists of: all along the slipping section (28) in said ejection area (28), there are withdrawable holding flanges (50), placed one after the other and each one linked to an exit gate (52) whose holding flanges (50) are operatively projected towards the center of the inclined bed (26), remaining overturned over the path of the back (55a), sliding over said slipping section (28).

20. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 19, characterized because this eighth ejector means of the magazine (55) consists of: an ejector shovel (48) in whose active surface there are longitudinal beveled edges (48a), and at the posterior end or upstream, and transverse (48b), on the side turned towards the center of the endless belt (26), a first actuator (49) of that ejector shovel (48) between a non-active concealable position and an active position that sticks out which notably reaches the limit level of that sliding section (4); a second actuator (51), of combined action with that first actuator (49) and which is associated with this withdrawable holding flange (50) operating between that active position that sticks out and a withdrawn ejection position of the magazine (55).

21. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claim 18, characterized because it is provided for that these tilting shafts (46) of the grate (46) are located on a section (44) covering said support means (27, 42, 43) against the drop of the endless belt (26) that corresponds to the visible surface of the belt, whose covering section (44) is provided with corresponding supports (45) with regard to said supports (42).

22. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 19 and 20, characterized because these withdrawable holding flanges (50) have a triangular expansion complement (50a) with turned edge, at the downstream end and the protruding crown of this complement (50a) is left keeping the continuity according to the retaining projection of the next flange (50) downstream.

23. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 22, characterized because this ninth means of access to the endless belt (26) inside the frame of the machine (25) consists of the legs (29) that support the machine (25) whose height can be adjusted, which have at the uppermost side a collapsible section (30) which surrounds that access for assembly and maintenance.

24. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 23, characterized because the places provided for the election of magazines (55) have trays (52) that have ball bearings (53) installed in their bed.

25. DEVICE FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 12 to 24, characterized because the outlet trays or gates (52) are extended partly interfering with the gate (52) immediately downstream, according to a deflector plate (54) in downward ramp.

26. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in particular for the simultaneous proportioning of different types of homogeneous or heterogeneous publications and even with gift objects and consequently with a variable shape and consistency, characterized because it is formed by a hopper (57) that collects the copies for processing, defined by a grooved bed (58), preferably inclined 35º, on which the

backs of the copies rest; a fixed reference wall (59) and side support; and a movable wall (60) which pushes the whole stack of copies from the back, guided along the channels of the grooved bed (58); it has been provided that the copies will be removed one by one from the front of the hopper (57) by a vacuum suction cap (61) which will be located over the copy which is to be removed and which has a reciprocating motion in coordination with the advance movement of the movable wall (60) and controlled by an electronic synchronism device when each copy drops on a conveyor belt.

27. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claim 26, characterized because the suction cap (61) is near the fixed wall (59) to guarantee its total support on the copy that is to be removed, irrespective of its size and also near the edge of the grooved bed (58).

28. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 26 and 27, characterized because the suction cap (61) has a device which detects whether the copy has not been seized to commence a retry before concluding its backward run, which will be made if a sensor (78) is not activated inside the suction cap (61), activated by the action of the suction cap on the copy.

29. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 26 to 28, characterized because the suction cap (61) has two bottom claws (72) which push the backs against posterior strips (66) that are joined to the grooved bed (58) of the hopper (57) and which allow a single copy to pass when the whole stack is pushed by the movable wall (60).

30. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claims 26 to 29, characterized because the suction cap (61) also has an inverted "U" shape structure whose plane is slightly more advanced than that of its front grate (70), in a complete withdrawn position, unsticking the copy when surplus suction remains after eliminating the vacuum.

31. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claim 26, characterized because the hopper (57) has a fluted section (64) at the edge of its grooved bed (58) which withholds the backs of the copies until the action of the suction cap (61) acts fully; and an air pressure ejector device (65) fitted at the bottom of the fixed wall (59) and near the fluted section (64) to prevent the possible approximation of the back of the copy near the one that has been suctioned.

32. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claim 26, characterized because the reciprocating mechanism of the suction cap (61) is obtained from a pneumatic cylinder (73) whose rod transmits its movement to a sliding tube (74) via a handle (75), and this sliding tube (74) acts as switch of the vacuum; there is a pressure compensation chamber to prevent an increase in friction on the sliding guides.

33. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES in accordance with claim 26, characterized because the movable wall (60) is moved by action of a cylinder (80) which responds to the deactivation of a sensor (79) fitted on the grooved bed (58) and partly on the fluted section (64).

34. AUTOMATIC FEEDER FOR PROCESSING THE RETURN OF UNSOLD ARTICLES, in accordance with claim 33, characterized because the movable wall (60) has a pusher plate (81) joined to it which optimizes its adaptation to the last copy in the stack, where a movable area of it is assisted by a pneumatic cylinder which also moves upwards when there is more than one re-try handling.

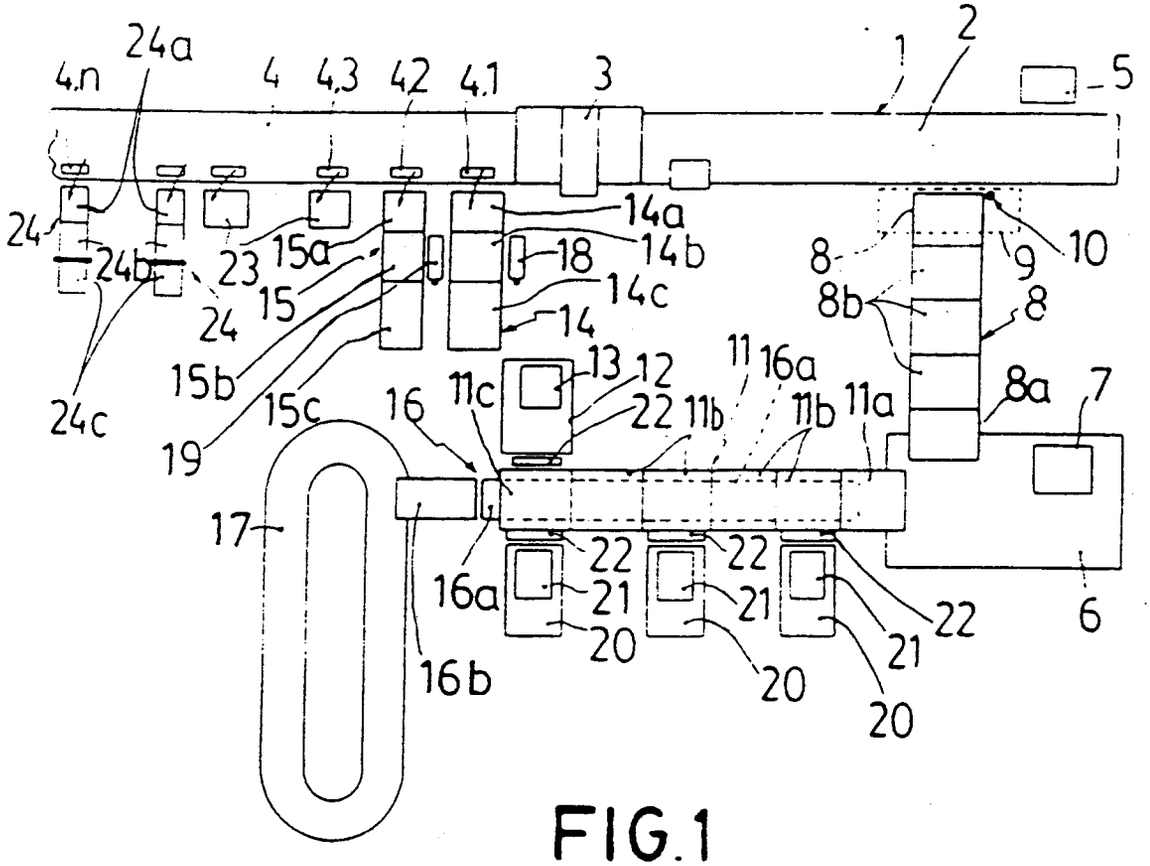
4.n
24a
4
4.3
4.2
4.1
3
1
2
5
24
24b
23
15a
15
24
14a
14b
18
14c
14
8
9
10
8b
8
15b
24c
19
15c
16
11c
13
12
22
11b
11
16a
11b
11a
8a
7
17
16a
22
21
20
22
21
20
22
21
20
6
16b

FIG.1

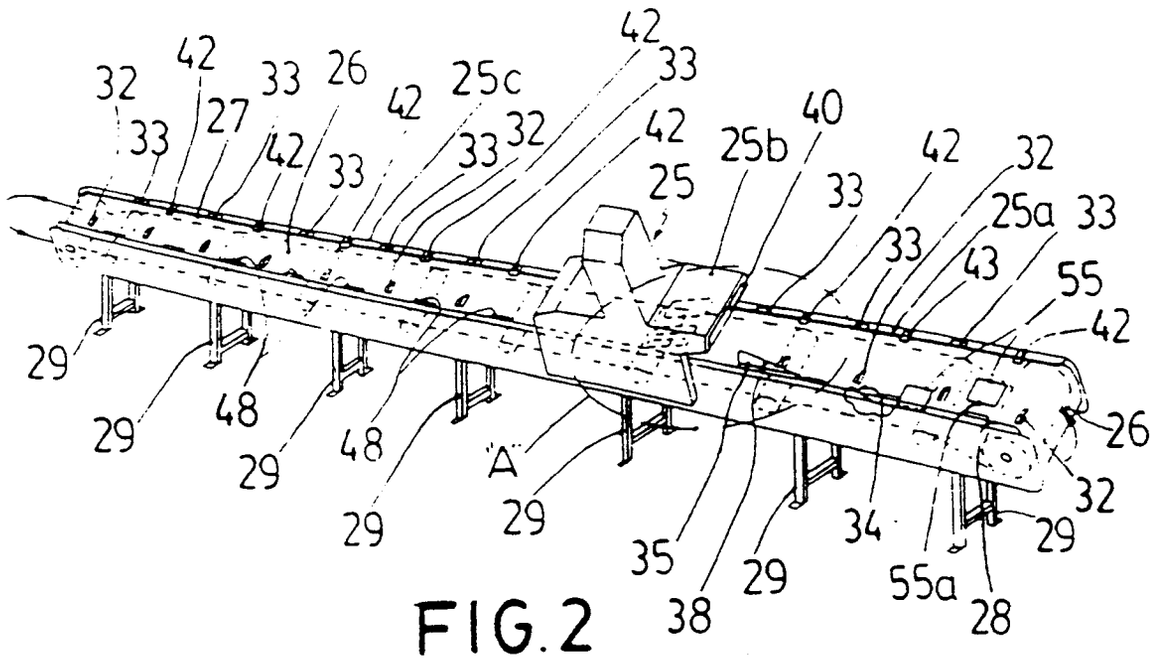
32
42
33
27
26
42
25c
42
33
33
32
42
33
25
25b
40
42
32
33
33
25a
33
43
55
42
26
32
29
29
48
29
48
29
A
29
35
38
29
34
55a
28
29

FIG.2

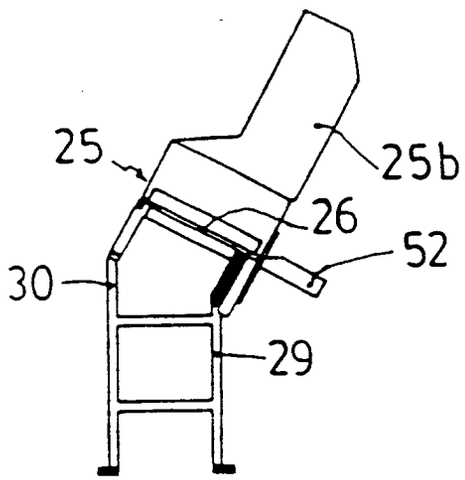
25
25b
26
52
30
29

FIG.3

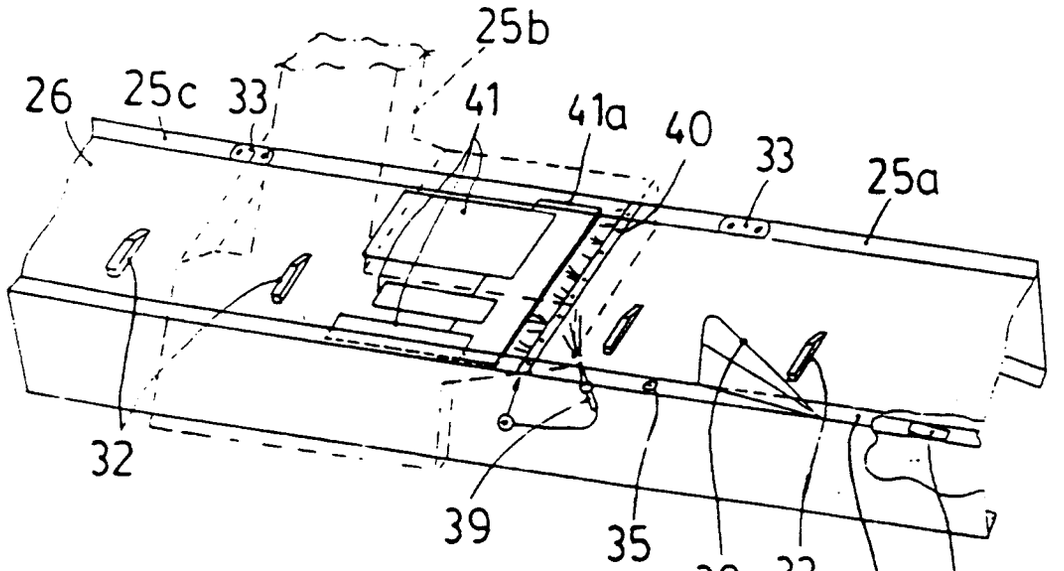
25b
26
25c
33
41
41a
40
33
25a
32
39
35
38
32
28
34

FIG.4

"A"

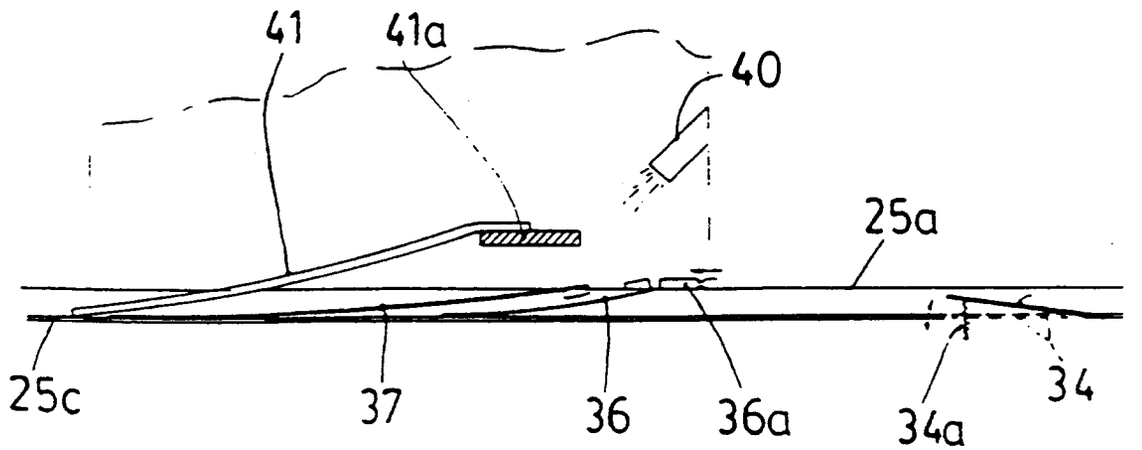
41
41a
40
25a
25c
37
36
36a
34a
34

FIG.5

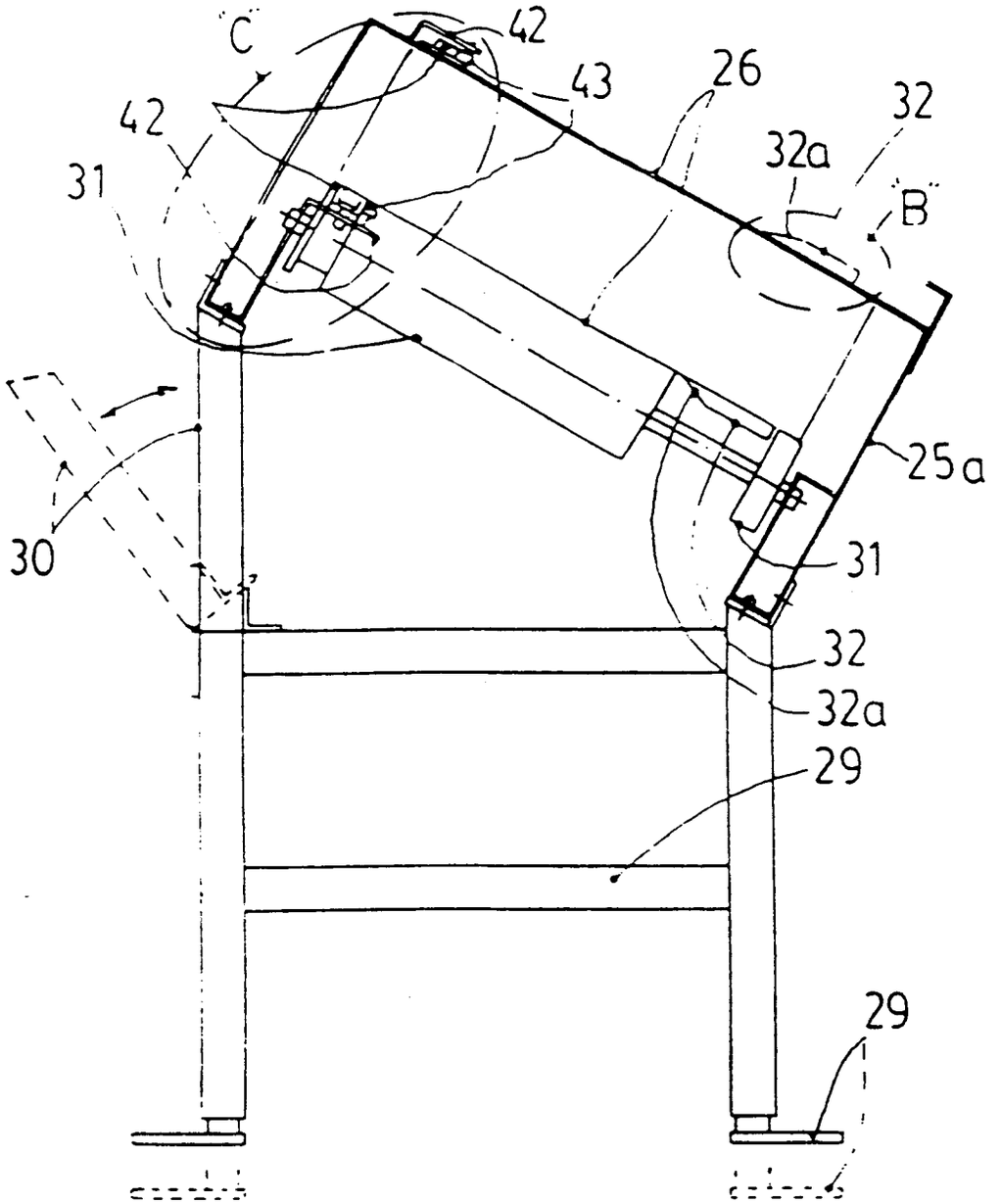

FIG.6

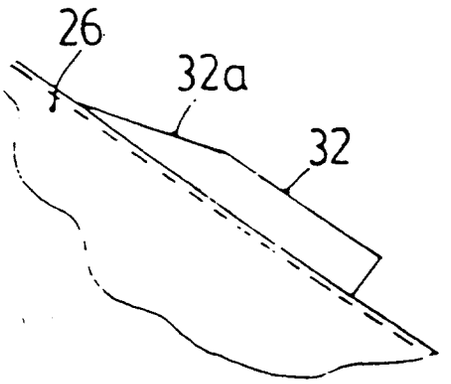

FIG.7
"B"

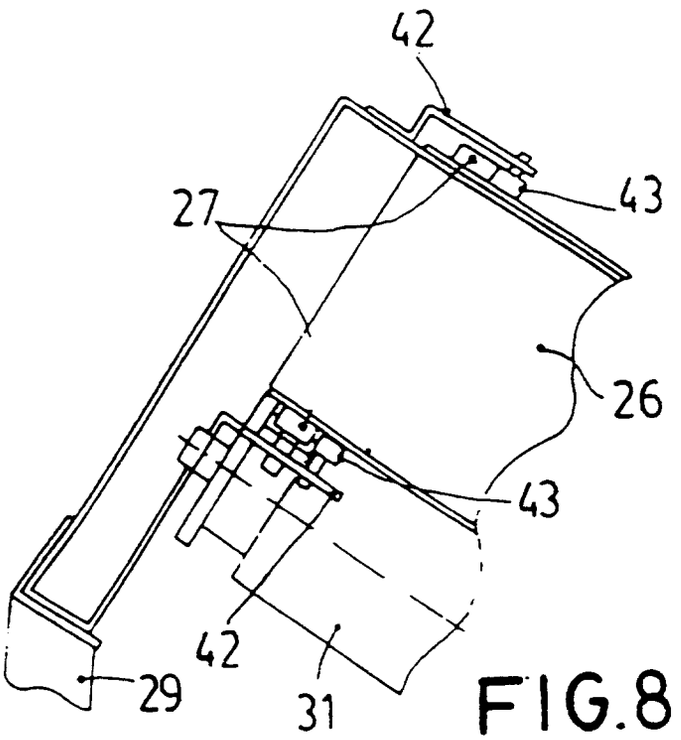

FIG.8
"C"

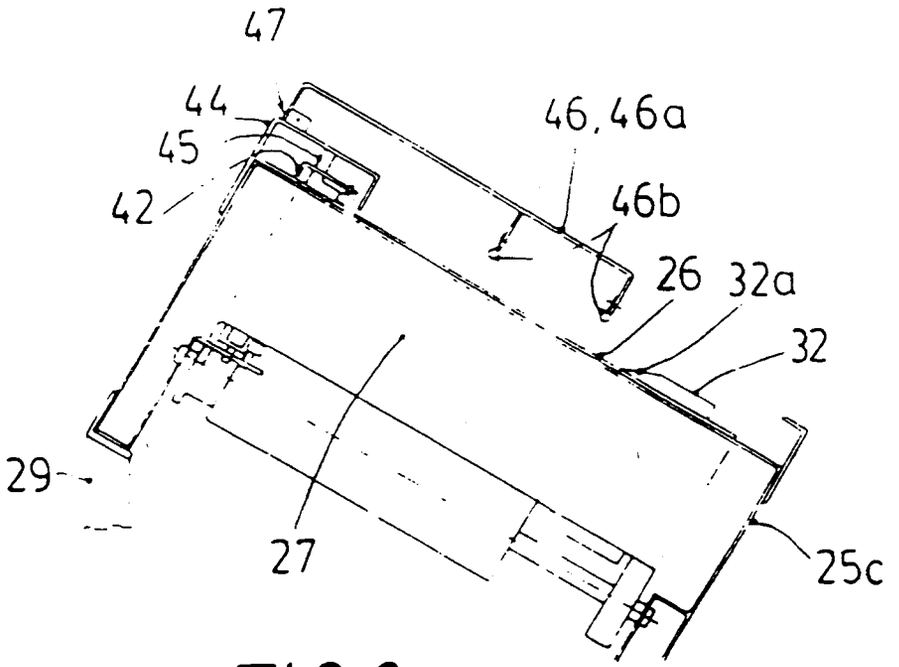
47
44
45
42
46, 46a
46b
26
32a
32
29
27
25c

FIG.9

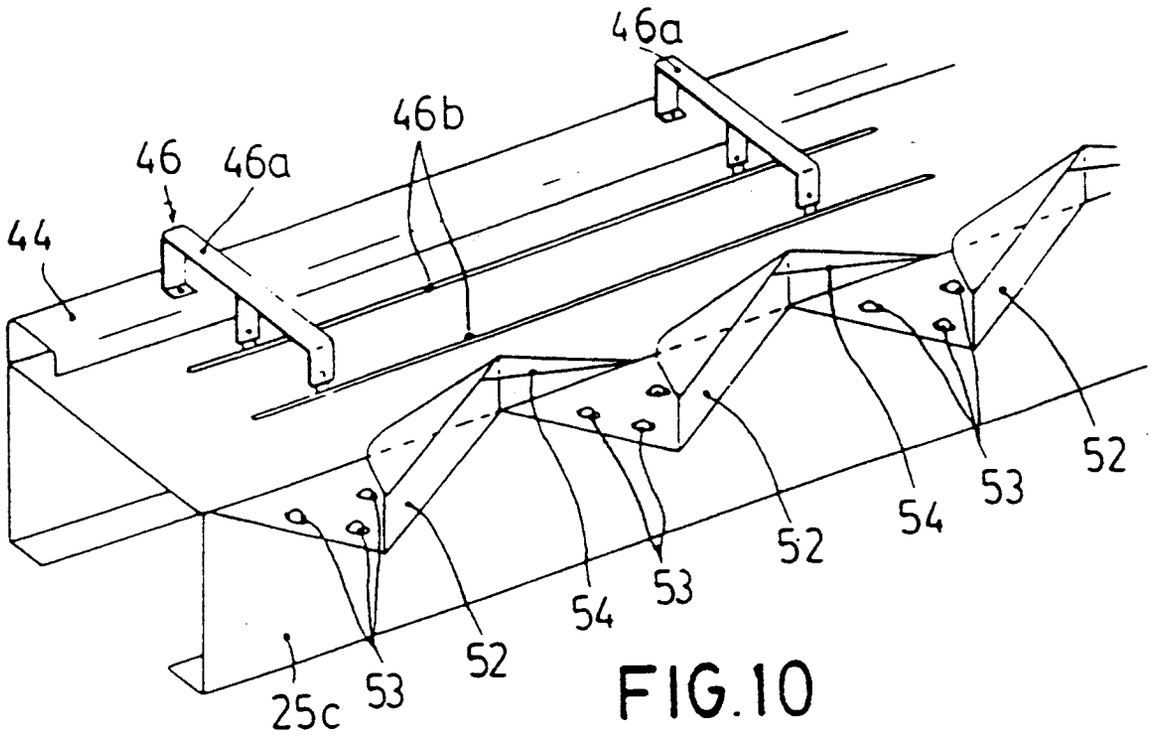
46a
46b
46
46a
44
52
53
54
52
53
54
52
53
25c

FIG.10

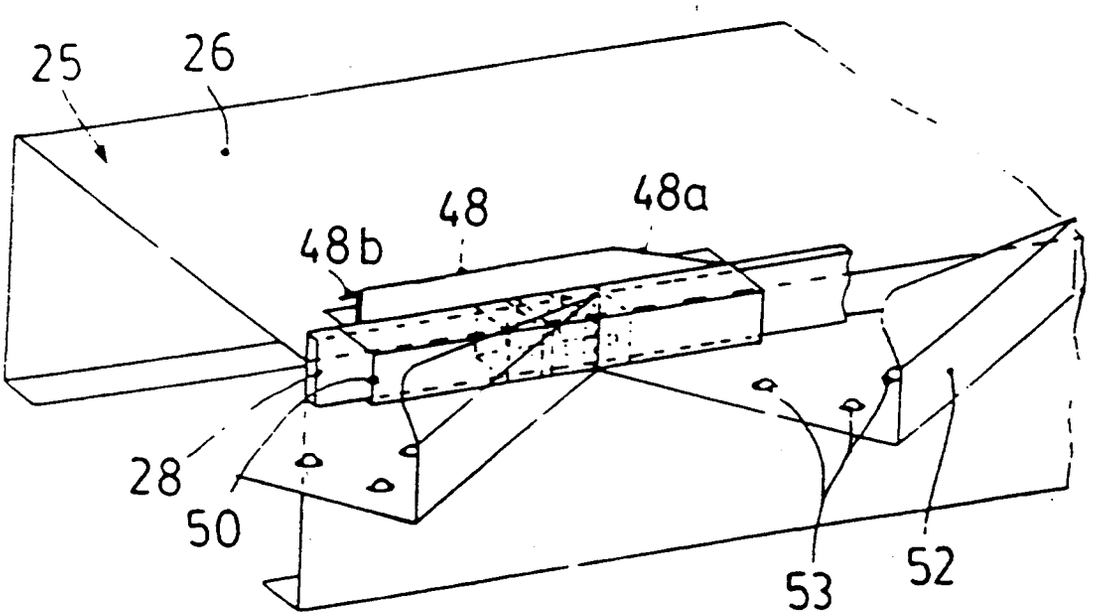

FIG.11

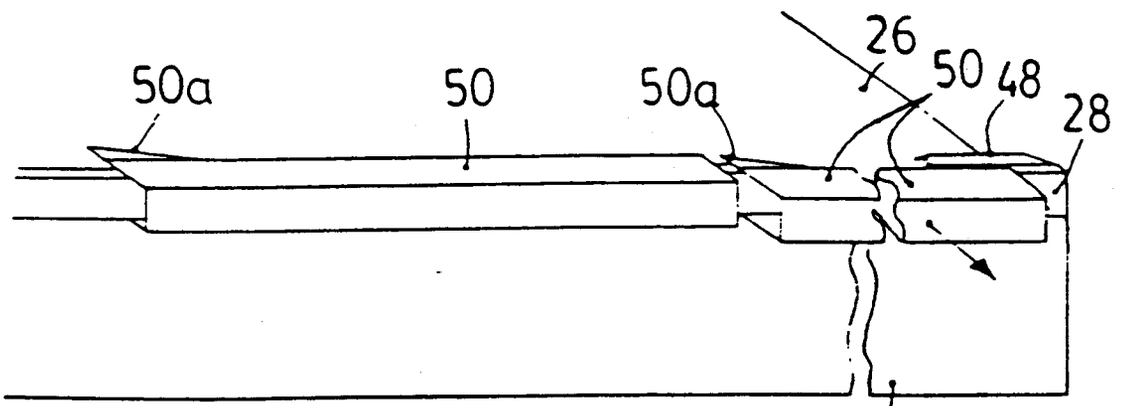

FIG.12

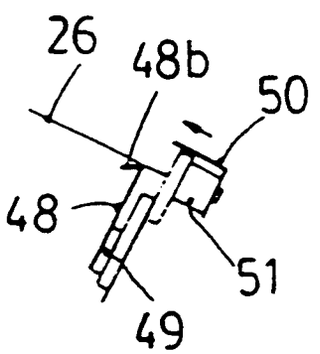

FIG.13

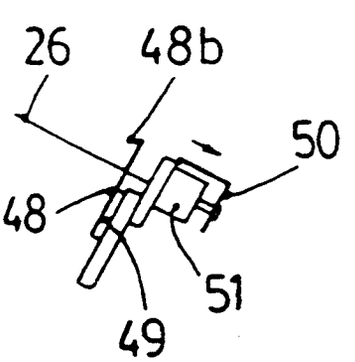

FIG.14

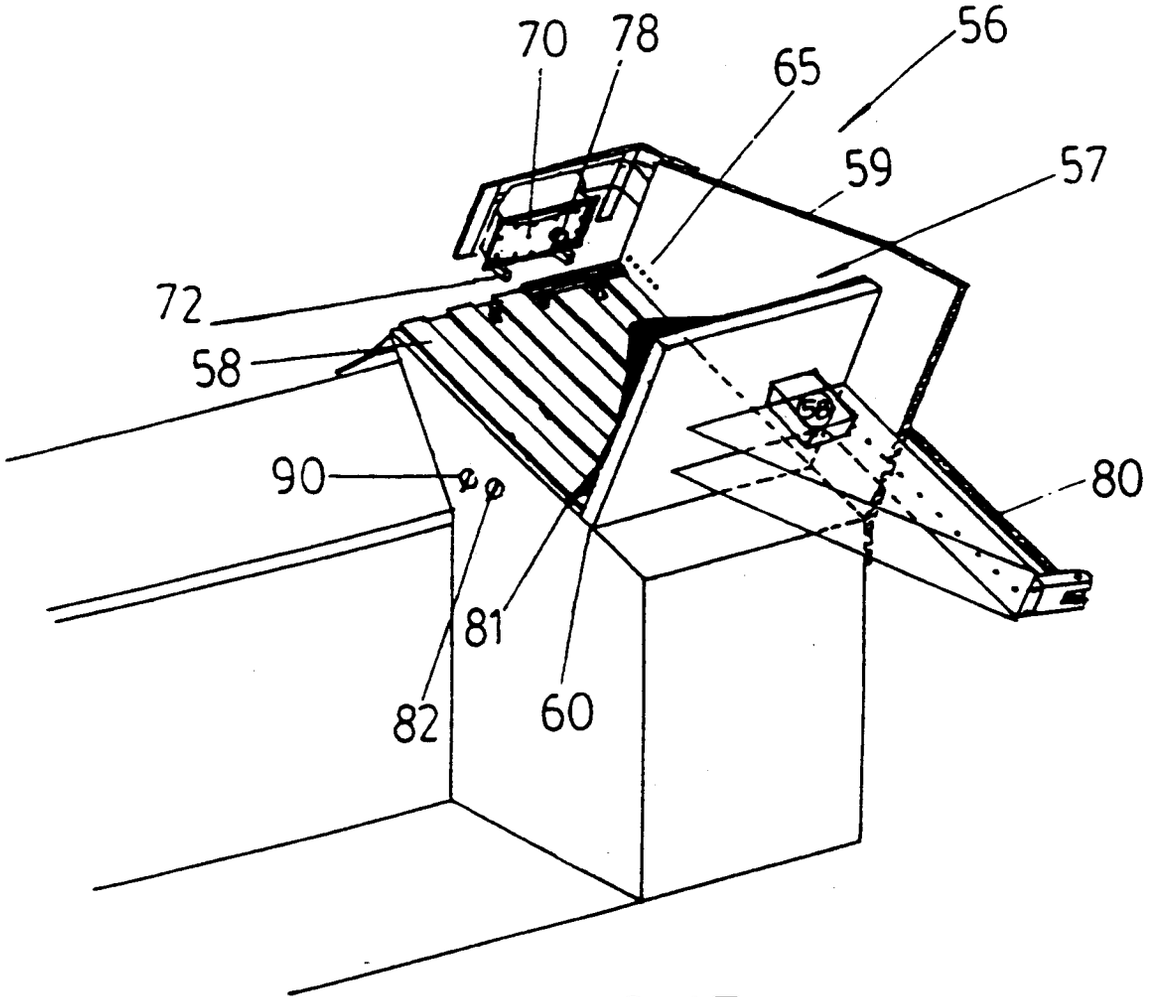

FIG.15

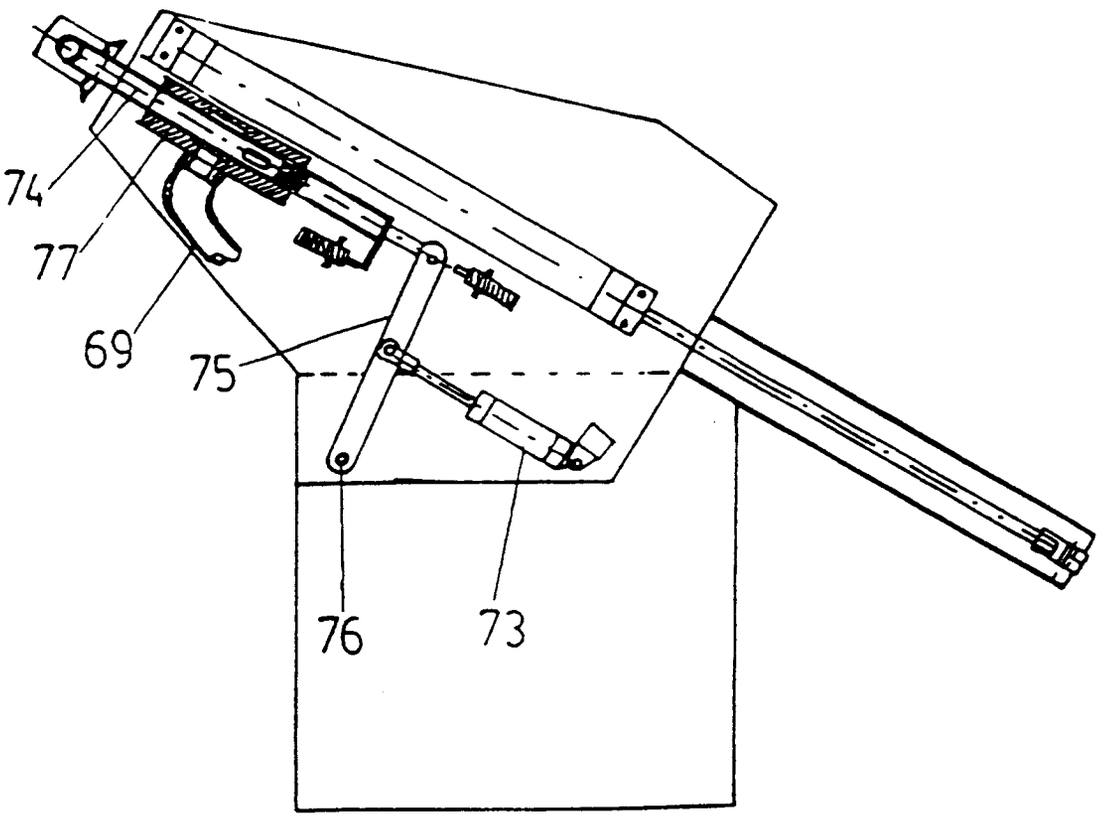

FIG.16

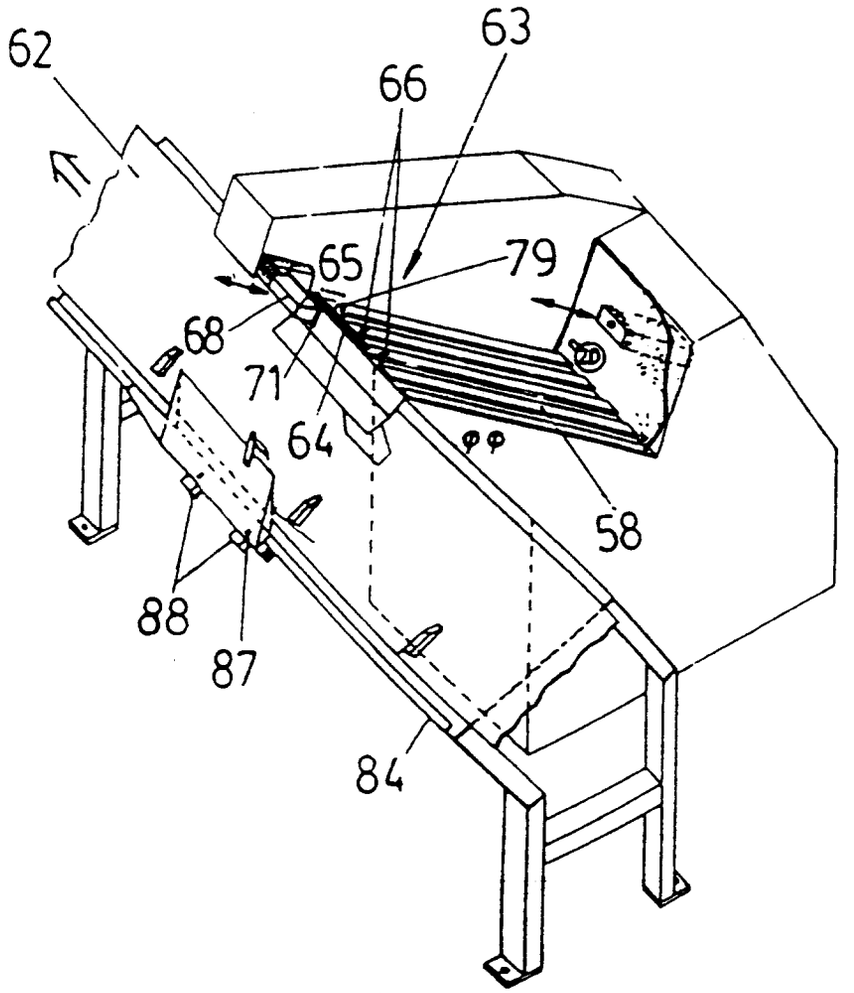

FIG.17

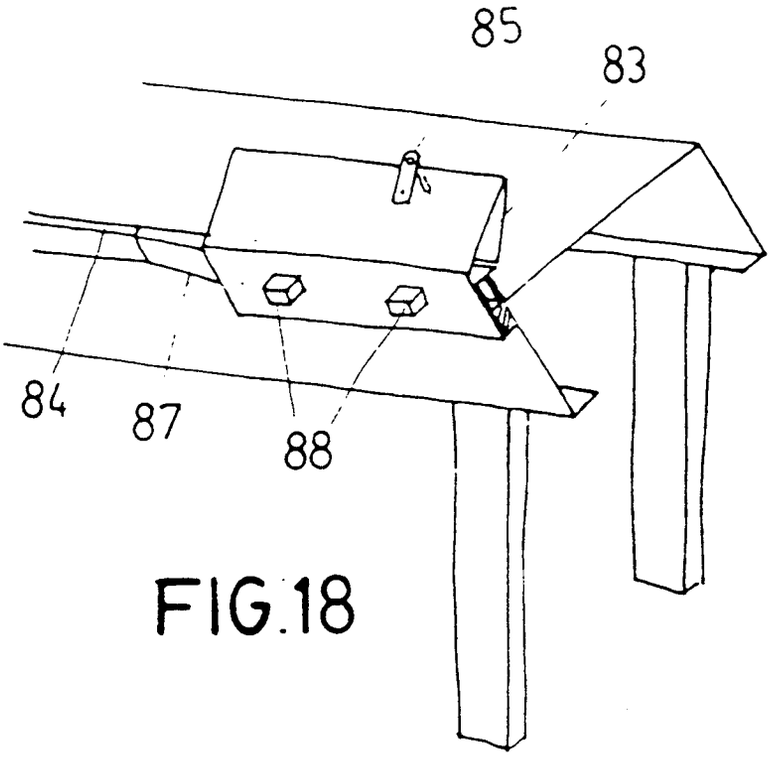

FIG.18

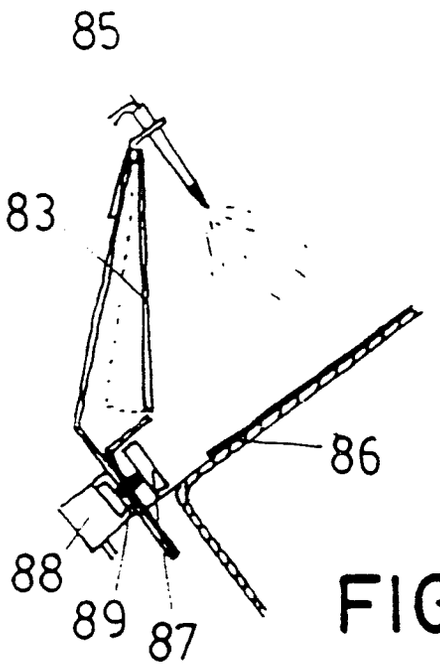

FIG.19

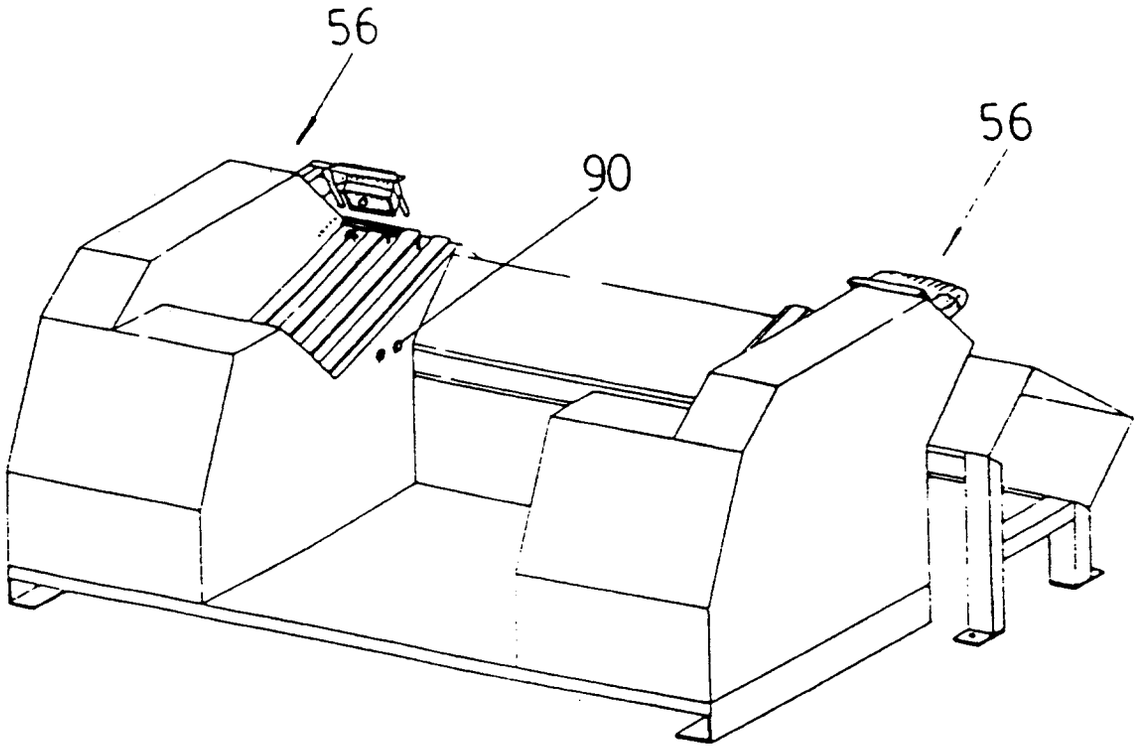

FIG. 20