

EUROPEAN PATENT APPLICATION

Application number: 90830069.2

Int. Cl.⁵: **B65G 47/30, B65B 23/22**

Date of filing: 28.02.90

Priority: 23.03.89 IT 339489

Pian di Macina Pianoro (Bologna)(IT)

Date of publication of application:
26.09.90 Bulletin 90/39

Inventor: **Monti, Giuseppe**
Via Dello Sport, 23
Pianoro (Bologna)(IT)

Designated Contracting States:
CH DE DK ES FR GB LI NL

Representative: **Dall'Olio, Giancarlo**
INVENTION s.n.c. Via Arienti 26
I-40124 Bologna(IT)

Applicant: **MARCHESINI GROUP S.p.A.**
Via Garganelli, 20

Device for placing various products, particularly incandescent lamps, into corresponding housings, according to predetermined varying orientations.

In a conveyor 20, which picks up the first lamp from a row F of lamps 15, a rotating roller 21, featuring a helical groove 22, and a bar 23 parallel to said roller 21, are operating together, so that the lower side of the bulb 16 of the lamp 15 may fit between the groove 22 and the bar 23. A series of movable housings 40 receives the lamps 15 at the outlet of the conveyor 20, while a series of pushers 41 provides for pushing the lamps into corresponding containers 42. A small plate 31, placed above

the conveyor 20, can traverse axially, and bears, integral with its ends, two double arms 32,34 which extend downwards and have two small shaped bars arranged parallel to the roller 21 and fastened to the free ends of the double arms 32,34.

The small bars are extending towards each other progressively, so that they intercept the base 17 of the lamp 15 passing through the conveyor and determine its inclination according to the position of the small plate 31.

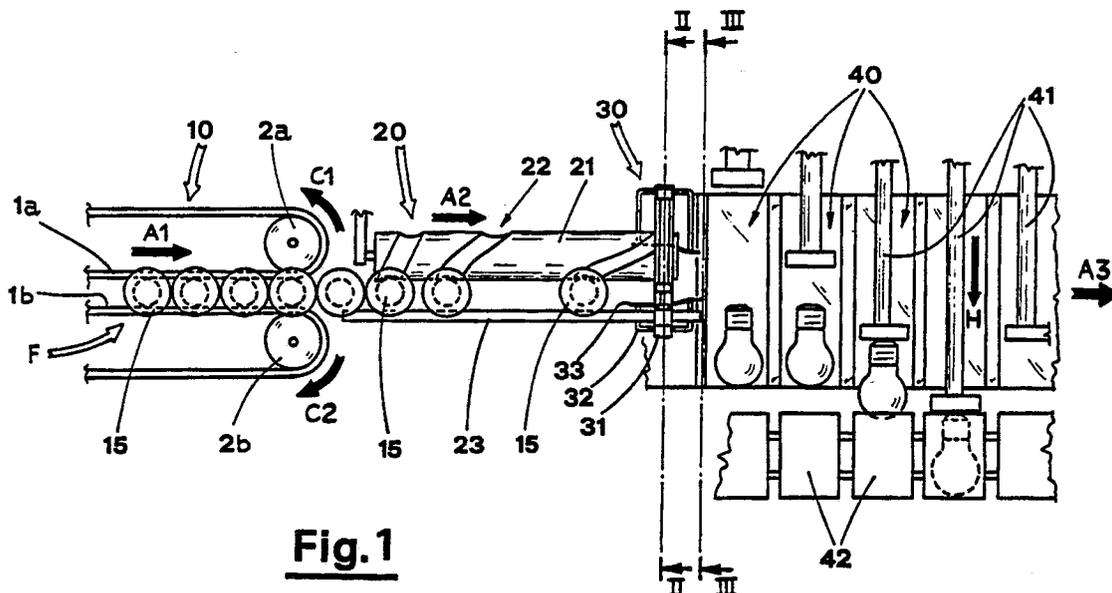


Fig. 1

EP 0 389 444 A1

DEVICE FOR PLACING VARIOUS PRODUCTS, PARTICULARLY INCANDESCENT LAMPS, INTO CORRESPONDING HOUSINGS, ACCORDING TO PREDETERMINED VARYING ORIENTATIONS

This invention is concerning a device that, being mounted on a machine for the packing of various products, particularly incandescent-type lamps, allows said products to be arranged, according to the requirements, either all of them orientated in the same way, or alternately orientated in opposite directions.

For the sake of simplicity and clearness, reference shall be made below to incandescent lamps, made up of a glass bulb, containing a filament, and of a base, electrically connected with the filament and having the double purpose of allowing the lamp to be fastened and the filament to be connected with the source of electric power.

It is understood that what is described below, can also be applied to the packaging of other products having the same shape and involving the same boxing problems as lamps do.

Devices are known, which pick up the lamps one by one from a conveyor on which they are set out in a row, and arrange them according to a predetermined orientation.

Basically, such devices are provided with spoked wheels suited to pick up the lamps by special means and to arrange them all orientated in the same direction into corresponding housings fitted in a series on a band or on a pair of chains.

After that, a set of pushers provides for moving the lamps along the housings, until they are fitted into corresponding containers.

Obviously, when the various containers are later packed (mechanically), all the lamps find themselves with their bulbs disposed on the same side. The bulbs, so lined up, are therefore subject to be pressed against each other, with a risk of damages to the bulbs themselves.

For the purpose of avoiding such a risk, it is necessary that the lamps are fitted into the relative containers with their bulbs alternately orientated in opposite directions.

As a matter of fact, the Italian Patent No. 1135666, corresponding to the German Patent No. 3011398, describes a device which is suited to arrange the lamps into the corresponding housings with their bulbs disposed alternately in a direction and in the opposite one.

The device described there is basically made up of two rotating wheels disposed with their axles at right angles. The first wheel, which has the purpose of removing a lamp from a row of lamps arranged on a guide, has a series of equidistant seatings on its perimeter, each of them being suited to receive the bulb of a lamp and to separate the latter from the row.

Subsequently, the lamps are fitted into corresponding equidistant seatings made on the perimeter of the second wheel. The seatings of the second wheel consist of a hole which extends radially from the outer surface of the wheel towards the center for a predetermined length. Then, the bottom of each radial hole is linked with a hole made obliquely. Subsequent radial holes are linked with oblique holes alternately orientated towards either side of the same wheel. The lamps are therefore fitted with their bases into the oblique holes and with their bulbs into the radial holes. After that the lamps are delivered by the second wheel into the corresponding housings, these shall find themselves with their bases alternately disposed on either sides.

It stands to reason that such a device is very complicated, both from a structural and from a functional point of view.

As every engineer knows very well, structural complexity involves high production costs and frequent servicing, while functional complexity means low productivity, frequent trouble arising during operation and low versatility of the machine.

The purpose of this invention is to present a device which can be fitted on machines for the packaging of various products, particularly incandescent lamps, in order to arrange said products, according to the requirements, either all of them orientated in the same way, or alternately orientated in opposite directions, through a technical arrangement which can be carried out easily and involves a reliable operation.

The said purpose is accomplished by means of a device for inserting various products, particularly incandescent lamps, into corresponding housings according to prefixed variable orientations, this device being of the type consisting of: a first conveyor on which a row of said lamps is formed, such lamps being arranged with their bases turned downwards and moving according to a predetermined feeding sense; a second conveyor, suited to cause the first lamp in a row of lamps to be separated from the same row, and also consisting of a roller, featuring on its outer surface, a helical groove, extending with an increasing pitch, according to a predetermined feeding sense, consecutive to the aforesaid feeding sense, with said second conveyor including also a bar set out parallel to said roller and at a distance from the latter, suited to allow the insertion, at least partial, of the lower part of the bulb of a lamp between said groove and the same bar, so that said lamp results to be supported on one side by said bar and on the other

side by the bottom of said groove and conveyed, as a consequence of the constant rotation of said roller according to a predetermined direction, according to said feeding sense, at an increasing speed as to the remaining lamps of said row; a series of housings, arranged side by side and made transversely movable according to a prefixed translational sense, placed immediately near the outlet of said second conveyor so to receive each of them a corresponding lamp inserted horizontally; a series of pushers moving in synchrony with said housings and progressively actuated transversely with respect to said housings so to push the lamps placed inside them, until they are inserted into corresponding containers, set out in a row and conveyed beside said housings in synchrony with the latter; said device being characterized in that it is consisting of first means suited to cause the gradual inclination of a lamp, while the same is conveyed through the terminal section of said conveyor, according to directions contained in planes perpendicular to said feeding sense and according to rightward or leftward senses as to said roller, in order to allow the same lamp to be properly inserted into the corresponding housing with its base consequently turned rightwards or leftwards as to the same housings.

The versatility of the device, as well as its structural and functional simplicity, are obtained through the present invention and all this brings about lower construction and service costs, a more reliable operation and a higher productivity (a greater number of lamps inserted into their housings in the same unit of time), as compared to the devices already known.

The features of this invention are pointed out below, with a reference to the drawings attached herewith, where:

- figure no. 1 shows an overall and schematic plan view of the device including the technical arrangement being the subject of this invention;

- figures no. 2a,b, show a schematic view of the device seen according to the section line II-II of figure 1, having means respectively disposed according to two characteristic positions.

- figures no. 3a,b, show a schematic view of the device seen according to the section line III-III of figure 1, having means respectively disposed according to two characteristic positions.

- figure no. 4 shows the same device as in figure 1 but seen from one of its heads.

- figures no. 5 and 6 respectively show a part of the device operating according to different modes.

With reference to the aforesaid figures, no. 10 indicates a first conveyor, for instance of the type consisting of two belts or bands wrapped as a ring

on related rollers 2a and 2b and having each a branch, 1a and 1b, parallel to each other.

The rollers 2a and 2b are caused to revolve according to counter-rotating senses C1 and C2, so that the two branches 1a, 1b, slide simultaneously and in synchrony according to the feeding sense A1.

The lamps 15 are inserted with their base 17 and the lower side of their bulbs 16 between the two branches 1a and 1b, thus turning out to be conveyed in the direction A1 and arranged in a row F.

After the first conveyor 10, there is a second conveyor 20, having basically the purpose of removing the lamp being the first in the row F from the same row.

The second conveyor is made up of a roller 21 featuring, on its outer surface, a helical groove 22 extending with an increasing pitch for the whole length of the roller, starting from the roller end next to the outlet end of the first conveyor 10.

Beside the roller 21, a bar 23 is placed, parallel to the same roller and extending for the whole length of the latter. The distance between the bar 23 and the roller 21 is such that the lower side of the bulb 16 of a lamp 15 may partially fit into the groove 22.

As it is well pointed out in the figures 2a, 2b, the upper side of the bulb 16 remains laying on the bar 23, on the one hand, and on the bottom of the groove 22 on the other hand. The lamp 15 is so supported by the conveyor and moved in the feeding direction A2, basically consecutive to the direction A1, when the roller 21 is dragged and caused to revolve according to the direction R (figure 2a,b.) by the groove 22.

The increasing pitch of the helical groove 22 causes the movement of the lamp 15 to accelerate, and the latter is thus removed from the row F.

The means 30, described below, are placed and operate next to the terminal section of the second conveyor 20, and are suited to determine the inclination of the lamp 15, which is passing through the said terminal section, according to planes perpendicular to the feeding sense A2 and in directions inclined on one side or on the other with respect to the same conveyor.

In particular, the means 30 are consisting of a small plate 31, placed above the said second conveyor transversely as to the latter, and able to slide axially (transversely as to the conveyor) according to opposite directions G1 and G2 between two end positions, respectively right D and left S; two double arms left 32 and right 34 respectively fastened to the ends of the small plate 31 and extending downwards to enclose the roller 21 and the bar 23 between themselves, and finally two shaped bars 33 and 35 fixed longitudinally (as to the feeding

direction A2) to the two pairs of free ends of the double arms 32,34 respectively.

The two double arms 32, 34 basically consist of two rods bent like a "°", whose free ends are bent like a "L" both on the same side.

The right double arm 34, fastened in its center part to the small plate 31, features two parallel vertical sections 29a, being beside the roller 21, and two parallel horizontal sections 29 contiguous to the vertical sections 29a and placed below the roller 21, with the horizontal section placed more downstream, with respect to the sense A2, longer than that placed more upstream (see figure 2a).

Similarly, the left double arm 32, fastened in its center part to the small plate 31, features two parallel vertical sections 28a, being beside the bar 23, and two parallel horizontal sections 28b contiguous to the vertical sections 28a and placed under the bar 23, with the horizontal section more downstream, with respect to the sense A2, longer than that placed more upstream (figure 2a).

The right bar 35, fastened to the horizontal sections 29b of the right double arm 34, corresponding to the roller 21, thus extends so to move increasingly towards the bar 23, considering the feeding sense A2.

Similarly, the left bar 33, fastened to the horizontal section 28b of the left double arm 32 and corresponding to the bar 23, extends so to move increasingly towards the roller 21, again considering the feeding sense A2.

The shift of the small plate 31 to either of the positions S and D is controlled by parts which can be of various kinds.

The figures attached herewith provide, as an example, for a jack 36, whose shaft 37 is fastened in a suitable position to the small plate 31, by means of a connecting element 38.

It is understood that positioning means of other kinds may be provided for, without questioning the limits of protection related to this invention.

Finally, after the second conveyor 20, there are the housings 40 which are to receive each a corresponding lamp 15 in horizontal position.

The housings 40, arranged side by side, are made transversely movable according to a translational sense A3 so that, each time, an empty housing finds itself beneath the outlet of the second conveyor 20.

A series of pushers 41 moves in synchrony with the housings for a predetermined length, and, according to already known techniques and procedures, each pusher 41 in the series is driven so to fit transversely, according to the direction H (figure 1) and progressively into the corresponding housing 40 and to push the lamp 15, placed there, until the latter is sent into a related container 42 which makes part of a row of containers moving forward

in synchrony with the housings on the opposite side as to the pushers 41.

In brief, the lamps 15 are therefore arranged in a row by the first conveyor and picked up, one after another, by the second conveyor 20, which provides for separating them from the rest of the row F and drives them into the housings 40. When every lamp 15 finds itself passing through the terminal section of the second conveyor 20, then, according to the positioning of the small plate 31 in the right position D (figures 2a,3a) or in the left one S (figures 2b,3b), the bar, respectively left 33 or right 35, intercepts the base 17 of the lamp 15 and pushes it in accordance with its conformation, causing the same lamp to be inclined.

For instance, the figures 2a and 3a show two subsequent positions where the lamp finds itself, with the small plate 31 shifted in the right position D.

In this way, the lamp 15 comes out from the second conveyor with its base 17 inclined rightwards, and it is driven into the corresponding housing 40 with its base still turned rightwards.

Conversely, the figures 2b and 3b are showing two subsequent positions where the lamp finds itself with the small plate 31 shifted in the left position S, so that the lamp 15 comes out from the second conveyor with its base 17 inclined leftwards, and it is driven into the corresponding housing 40 with its base still turned leftwards. Thus, the shift of the small plate in either position determines the orientation of the lamps 15 inside the housings 40 and, of course, in the containers 42.

It stands to reason that it is possible to determine a fixed orientation for the lamps (all of them orientated in the same way) inside the housings 40, by positioning the small plate 31 in a prefixed position S or D.

On the other hand, it is also possible to determine an alternate orientation of the lamps 15 (with their bases 17 alternately turned rightwards or leftwards as to the sense A3; see figure no.5) inside the housings 40, by alternately shifting the small plate 31, every time a lamp is passing through the second conveyor 20, in the position D and in the position S.

The alternate orientation of the lamps makes it possible, of course having properly modified the terminal part of the aforesaid device, to insert two lamps together into the same housing 140. Both lamps are then pushed together into the same container 142 (figure 6) by the pushers 141. Finally, it is possible to provide for the orientation of lamps at any frequency, as required.

As a matter of fact, the shifting of the small plate 31 can be "programmed" conveniently and easily through means, not illustrated as they are already known, which provide for controlling the

actuation of the jack 36 according to a predetermined frequency.

Claims

1) Device for inserting various products, particularly incandescent lamps, into corresponding housings according to prefixed variable orientations, this device being of the type consisting of: a first conveyor (10) on which a row (F) of said lamps (15) is formed, such lamps being arranged with their bases (17) turned downwards and moving according to a predetermined feeding sense (A1); a second conveyor (20), suited to cause the first lamp in a row (F) of lamps (15) to be separated from the same row (F), and also consisting of a roller (21), featuring on its outer surface, a helical groove (22), extending with an increasing pitch, according to a predetermined feeding sense (A2), consecutive to the aforesaid feeding sense (A1), with said second conveyor (20) including also a bar (23) set out parallel to said roller (21) and at a distance from the latter, suited to allow the insertion, at least partial, of the lower part of the bulb (16) of a lamp (15) between said groove (22) and the same bar (23), so that said lamp (15) results to be supported on one side by said bar (23) and on the other side by the bottom of said groove (22) and conveyed, as a consequence of the constant rotation of said roller (21) according to a predetermined direction (R), according to said feeding sense (A2), at an increasing speed as to the remaining lamps of said row (F); a series of housings (40), arranged side by side and made transversely movable according to a prefixed translational sense (A3), placed immediately near the outlet of said second conveyor (20) so to receive each of them a corresponding lamp (15) inserted horizontally; a series of pushers (41) moving in synchrony with said housings (40) and progressively actuated transversely with respect to said housings so to push the lamps placed inside them, until they are inserted into corresponding containers (42), set out in a row and conveyed beside said housings (40) in synchrony with the latter; said device being characterized in that it comprises first means (30) suited to cause the gradual inclination of a lamp (15), while the same is conveyed through the terminal section of said conveyor (20), according to directions contained in planes perpendicular to said feeding sense (A2) and according to rightward or leftward senses as to said roller (21), in order to allow the same lamp (15) to be properly inserted into the corresponding housing (40) with its base (17) consequently turned rightwards or leftwards as to the same housings (40).

2) Device as in claim 1, characterized in that

said first means (30) include: a small plate (31), placed above said second conveyor (20) transversely as to the latter and able to slide axially according to opposite senses (G1, G2) perpendicular to said roller (21), between two end positions respectively right (D) and left (S); two double arms, left (32) and right (34), respectively fastened to the ends of said small plate (31) and extending downwards to enclose said roller (21) and said bar (23) between themselves; two shaped bars, left (33) and right (35), set out parallel to said roller (21) and respectively fastened to the two pairs of free ends of said double arms (32,34), with said right bar (35), fastened to said right double arm (34), corresponding to said roller (21), extending so to increasingly approach said bar (23), considering said feeding sense (A2), and with said left bar (33), fastened to said left double arm (32) and corresponding to said bar (23), extending so to increasingly approach said roller (21).

3) Device as in claim 2, characterized in that said double arms (32,34) basically consist of two rods bent like a "°", whose free ends are bent like a "L" both on the same side, with said right double arm (34), fastened in its central part to an end of said small plate (31), extending according to two first vertical parallel sections (29a), being beside said roller (21), and two first horizontal parallel sections (29b) consecutive to said first vertical sections (29a) and placed beneath said roller (21), of which the horizontal section being more downstream, considering said feeding sense (A2), is longer than that placed more upstream, and with said left double arm (32), fastened in its central part to the opposite end of said small plate (31), extending according to two second vertical parallel sections (28a), being beside said bar (23), and two second horizontal parallel sections (28b) consecutive to said second vertical sections (28a) as well as placed beneath said bar (23), of which the horizontal section placed more downstream, considering said feeding sense (A2), is longer than that placed more upstream.

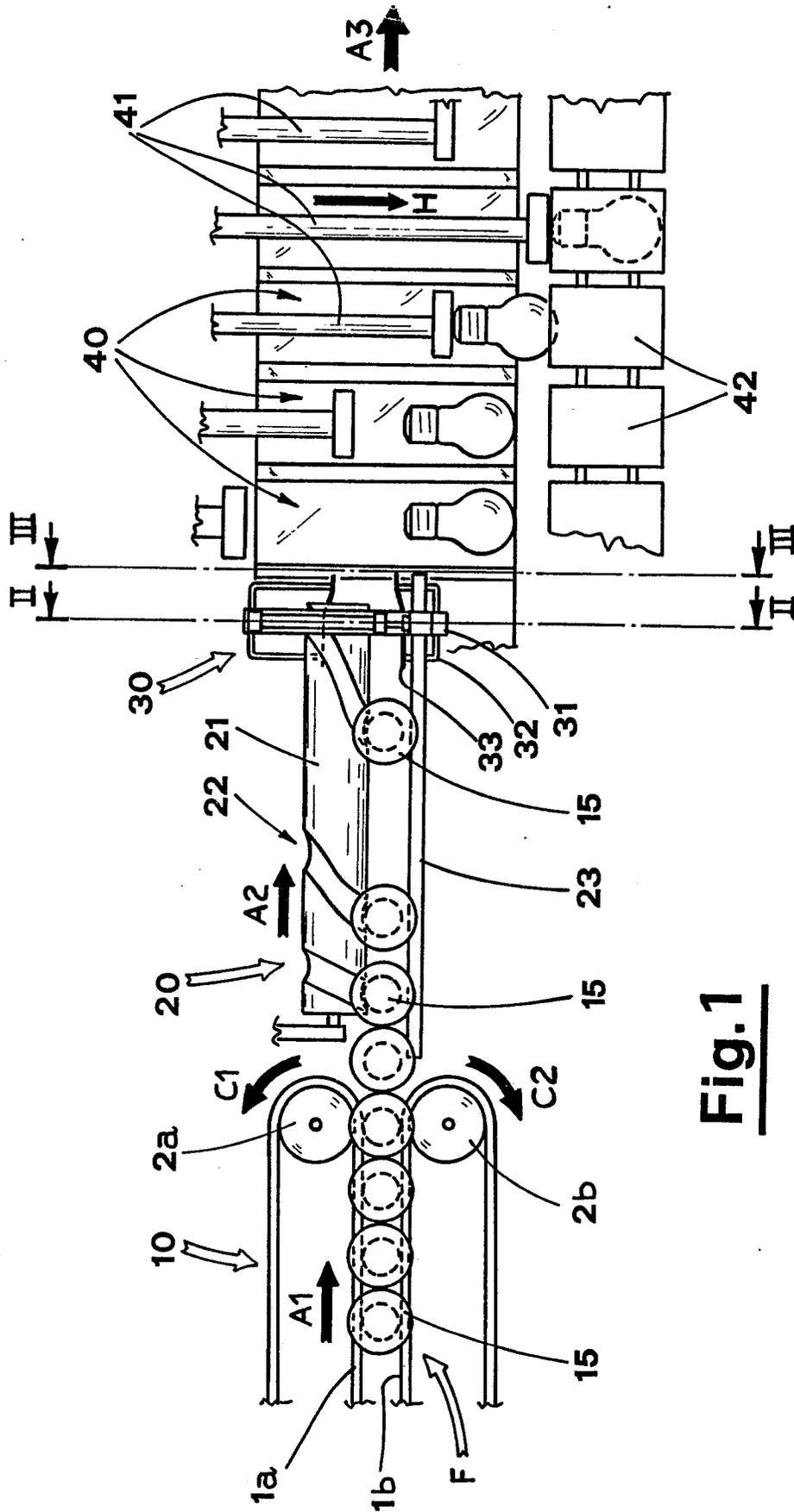


Fig.1

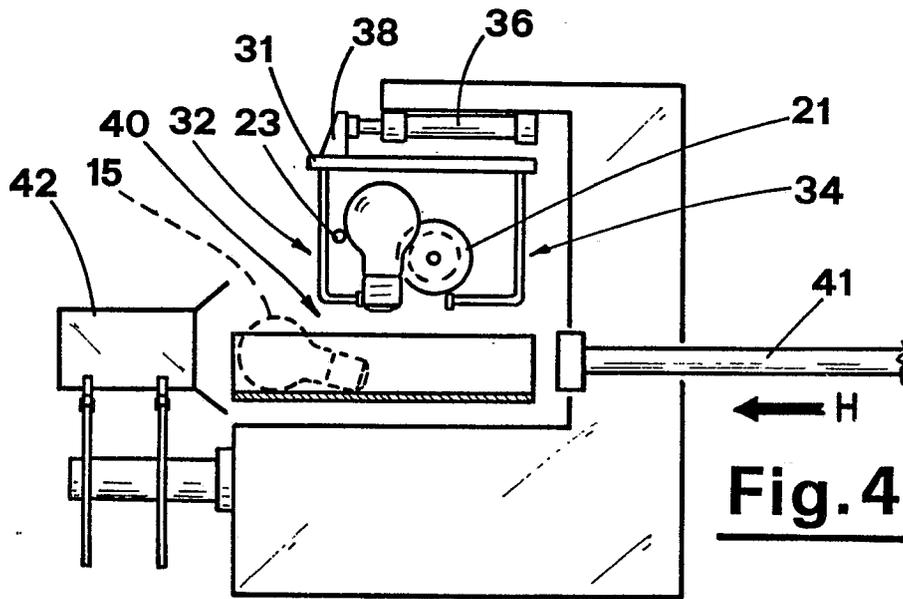


Fig. 4

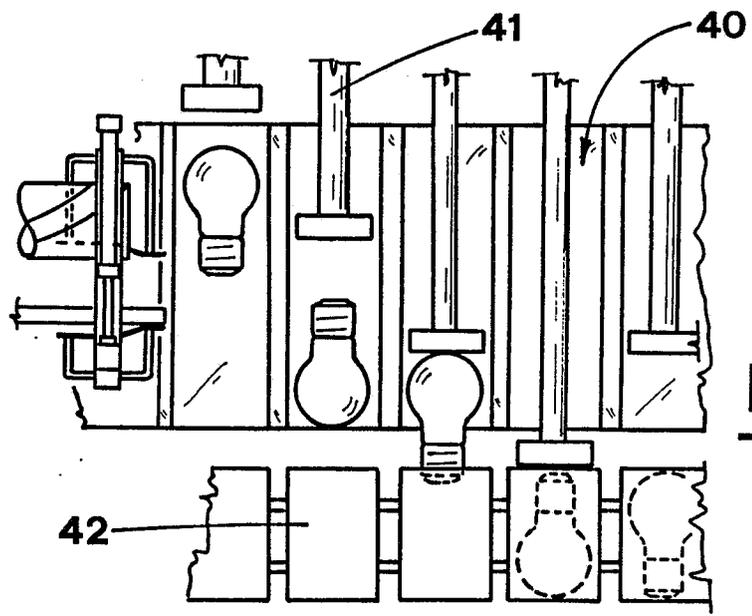


Fig. 5

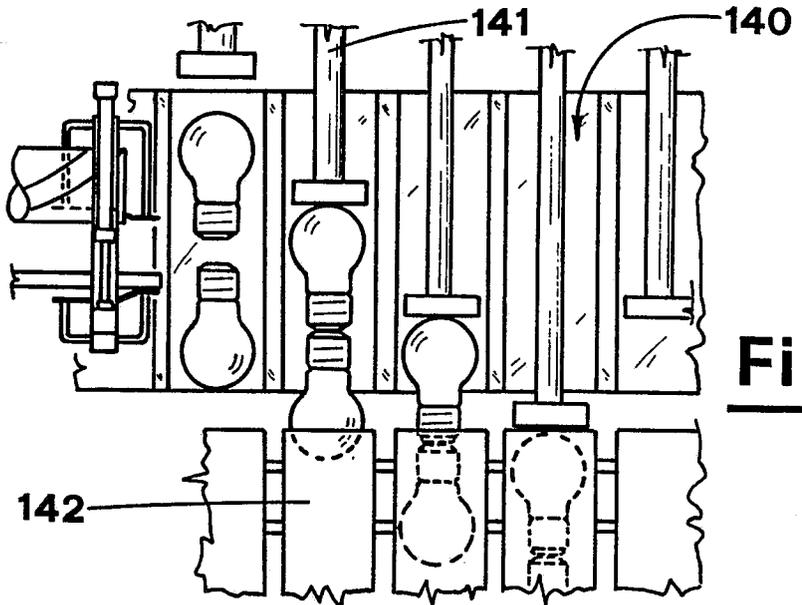


Fig. 6



DOCUMENTS CONSIDERED TO BE RELEVANT			EP 90830069.2
Category	Citation of document with indication where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl ⁷)
A	<p>US - A - 4 509 309 (LANGEN et al.) * Totality * -----</p>	1	<p>B 65 G 47/30 B 65 B 23/22</p>
			<p>TECHNICAL FIELDS SEARCHED (Int Cl⁷)</p>
			<p>B 65 B B 65 G</p>
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 23-05-1990	Examiner PISSENBERGER
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			