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(71) Applicant : **GIMI S.r.l.**
Viale E. Kant, 26
I-06011 Città di Castello, PG (IT)

(72) Inventor : **Ponti, Giuseppe**
Via Copernico, 38
Città di Castello, Perugia (IT)

(74) Representative : **Sneider, Massimo**
Studio Tecnico Lenzi, Via Lucania, 13
I-00187 Roma (IT)

(54) **Machinery for wrapping books, magazines and the like with paper.**

(57) The object of this invention is a totally automatic wrapping machine for newspapers, magazines, books and the like, with the use of any kind of paper ; featuring a very high wrapping speed, two ways of glueing the edges of the wrapper lengthwise and the possibility of achieving two different finishings, by modifying the end part of the machine.

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For several years now magazines and books are being sold with polyethylene wrappers, which are an effective means of protection from any damage which could occur during transportation; such a wrapping machine, for example, is described in a CMC patent, no. 1.196.631 dated 19th September 1986. This fully automatic machine takes one magazine or other object at a time and wraps it in an adequately cut and sealed PVC wrapper. Growing concern for environmental pollution and a certain degree of aversion to the widespread use of plastic materials, which are considered dangerous pollutants because they are not biodegradable, however, has led to the study and planning of a machine for wrapping newspapers, magazines and the like with paper and other similar materials.

The object of this invention is a totally automatic wrapping machine for newspapers, magazines, books and the like, with the use of any kind of paper, featuring a very high wrapping speed, two ways of glueing the edges of the wrapper lengthwise and the possibility of obtaining two different finishings, by modifying the end part of the machine, according to the following description.

First of all, the machine consists of a magazine drawing device which takes the magazines, one by one, from a pile; this is followed, in sequence, by another device which opens the first page of each magazine, while one or more feeders may introduce an insert inside the opened magazine. There are two rolls of paper, preferably placed in the lower part of the machine and provided with a lateral unwinding device; the paper is unrolled lengthwise, underneath the object to be wrapped, the magazine, for example, which then passes under a small motorized press.

The magazines are kept at a fixed distance the one from the other, while a hot-melt glueing machine, controlled by photocells and an encoder, applies glue, cross-wise, on the wrapping-paper.

While the magazine or other object advances along the line the longitudinal edges of the sheet of paper are folded upwards towards the centre of the object, while another glueing machine, also controlled by photocells and an encoder, applies the glue lengthwise.

The magazine or other object then passes under a pressing pad and a glueing press, which applies the necessary pressure in order to ensure that the previously glued edges effectively stick together.

A cutting machine then cuts the paper between the sequence of magazines, while an adequate press separates the copies.

Following is a possible variation: the roll of paper may have pre-glued areas, thus making the hot glueing machine unnecessary; in this case the edges of the wrapping are stuck together simply by means of the application of a strong pressure.

It is possible to obtain better finished copies by simply modifying the foregoing machine.

According to the following version, the machine is exactly the same as the aforementioned one up to the paper unwinding device, the paper still being unrolled lengthwise under the object to be wrapped. The change affects the sequence and the way in which the glue is applied along the edges of the sheet of paper: these are folded by two lateral blades, while a glueing machine, controlled by photocells and an encoder, applies the glue lengthwise. The magazine or other object then passes under a pressing pad and a glueing press, which applies the necessary pressure in order to ensure that the previously glued edges effectively stick together.

A cutting machine then cuts the paper at a pre-established distance between the two magazines, leaving an adequate margin along the two unglued edges. The magazine, with two edges of its wrapping still open, is then transferred, by means of a conveyor belt or the like, to another unit of the machine placed at right angles, with regard to the previous unit, so that the magazines or other objects undergo a 90° rotation; this enables the following two pairs of folding blades to fold the edges of the wrapping that are still open and apply the glue. The first pair of folding-blades is for magazines and longer objects, while the second pair is for shorter objects, such as books.

Following is a more detailed description of the foregoing machine, which makes reference to the attached illustrations:

Fig. 1 shows a front view of the machine.

Fig. 2 shows a view of the machine from the top.

Fig. 3. shows a detail of the cutting devices.

Fig. 4 shows a detail of the wrapping device for larger-sized objects.

Fig. 5 shows a front view of the modified version.

Fig. 6 shows a plan of the machine.

Fig. 7 shows a plan of the folding and glueing devices.

Fig. 8 shows the various stages of folding and glueing carried out by the unit shown in fig. 7.

With reference to the above illustrations, the machine consists of the following elements: a magazine drawing device (1), which takes the magazines, one by one, from a pile, an opening device (2), which opens the first page of each magazine and one or more feeders (3) which may introduce an insert inside the opened magazine.

The paper, or other similar material employed, consists of rolls (8), provided with a lateral unwinding device, which are preferably placed in the lower part of the machine; the paper, therefore, is unrolled lengthwise underneath the object to be wrapped, such as the magazines, for example, which then pass, at a fixed distance the one from the other, under a small motorized press (4). A hot-melt glueing machine (5), controlled by photocells and an encoder, then applies two stripes of glue cross-wise, between one magazine

and the other. As the magazine or other object advances along the line, the edges of the sheet of paper are folded towards the centre while another glueing machine (7), also controlled by photocells and an encoder, may spray the glue lengthwise. The longitudinal edges of the wrapping are then gradually closed one over the other as the line advances, the magazine or other object then passes under a pressing pad (9) and under a glueing press which applies the necessary pressure, so as to ensure that the previously glued edges effectively stick together. A cutting machine (11) then cuts the paper cross-wise, while an adequate press (12) separates the copies. This sequence is completed by a labelling machine which applies address tags and the like.

As previously explained, this machine is particularly suitable for wrapping magazine and the like; in order to adapt it to larger objects, such as books, a special unit has been planned, shown in fig. 4, which, placed at the end of the foregoing processing sequence, receives the already wrapped copies (19) carrying them forward beneath two glueing machines (22), which spray a certain amount of glue on the package unoccupied, for example, by the book. Two folding blades (23) close the paper, thus producing a wrapping which besides being well-finished is also strong and resistant, thus preventing any movement of the book or the other object contained within.

Another version of this machine has been planned for achieving a considerably higher wrapping speed, at the same time enhancing the quality of the wrapper. The initial part of the machine is the same as the previously described one, the differences being in the folding and glueing devices.

This modified version, as may be easily seen from the figures shown in tab. 2/2, consists of a magazine drawing device (31) which takes the magazines, one by one, from a pile. An opening device (32) opens the first page of each magazine thus enabling one or more feeders (33) to introduce an insert inside the opened magazine. Two rolls of paper (38), provided with a lateral unwinding device, are preferably placed in the lower part of the machine; the paper, therefore, is unrolled lengthwise, underneath the object to be wrapped, such as the magazines, for example, which pass under a small motorized press (34) at a fixed distance the one from the other. As the magazine or other object advances along the line, the edges of the sheet of paper are folded towards the centre and the glueing machine (37), controlled by photocells and an encoder, applies the glue lengthwise. The magazines or other objects then pass under a pressing pad and then under a glueing press (39), which applies the necessary pressure in order to ensure that the previously glued edges effectively stick together. A cutting device (41) then cuts the paper cross-wise, leaving an adequate margin to complete the glueing and finishing of the other two edges. The lateral folding and glueing unit of the machine is placed at right angles, with regard to the previous unit, so that the magazines or other objects undergo a 90° rotation. The copies are then fed into the unit shown in fig. 7, which ensures the perfect folding and glueing of both the magazines aid the books.

Claims

1. A machine for paper-wrapping newspapers, magazines and the like, consisting of the following elements: a magazine drawing device (1), which takes the magazines one by one from a pile; an opening device (2), which opens the first page of each magazine and one or more feeders (3), which may introduce an insert inside the opened magazine; the paper, or other similar wrapping material, consists of rolls (8) provided with a lateral unwinding device.

2. A machine for paper-wrapping newspapers, magazines and the like, with the following feature: the objects to be wrapped pass at a fixed distance the one from the other under a small motorized press (4). A hot-melt glueing machine (5), controlled by photocells and an encoder, applies two stripes of glue corss-wise, at the desired distance between one magazine and the other. As the magazine or other object advances along the line another glueing machine (7), also controlled by photocells and an encoder, may spray the glue lengthwise.

3. A machine for paper-wrapping newspapers, magazines and the like with the following feature: the object to be wrapped passes between two folding blades which gradually close the edges of the wrapping over each other, the magazine or other object then passes under a pressing pad (9) and under a glueing press (10). A cutting machine (11), assisted by an adequate press (12), separates the copies the one from the other.

4. A machine for paper-wrapping newspapers, magazines and the like, featuring a special unit for wrapping larger objects, such as books. Said unit receives the already wrapped copies (19) carrying them forward, cross-wise, beneath two glueing machines (22), which spray a certain amount of glue on the package unoccupied, for example, by the book. Two folding blades (23) close and glue the edges, thus completing the wrapper.

5. A machine for paper-wrapping newspapers, magazines and the like, featuring a modified version which, while maintaining the part of the

abovementioned machine up to the paper unwinder, which operates in the same direction as the objects to be wrapped, unchanged, provides for the following: the magazine advances along the line and the longitudinal edges of the paper are folded towards the centre, while the glueing machine (37), controlled by photocells and an encoder, sprays the glues lengthwise. The longitudinal edges of the wrapping are gradually closed over each other and the magazine or other object then passes under a pressing pad (39) and a glueing press (41) which applies the necessary pressure, in order to ensure that the previously glued edges effectively stick together. Following is a possible variation: the roll of paper may have pre-glued areas, thus making the hot glueing machine unnecessary; in this case the edges of the wrapping are stuck together simply by means of the application of a strong pressure.

6. A machine for paper-wrapping newspapers, magazines and the like with the following feature: still according to the abovementioned modified version, a cutting-device (31) then cuts the paper cross-wise, while another device separates the copies the one from the other.

7. A machine for paper-wrapping newspapers, magazines and the like featuring a lateral folding and glueing unit placed at right angles, with regard to the previous part, so that the magazines or other objects, in passing from one unit to the other, undergo a 90° rotation. The books or magazines, with an adequate margin along the edges, pass between a pair of folding blades (39), which perform the first folding, a glue-spraying device (40) sprays the glue onto the edges and as the item proceeds along the line a second pair of blades (41), closer than the previous pair, close the edges previously sprayed with glue, thus obtaining a perfect wrapping.

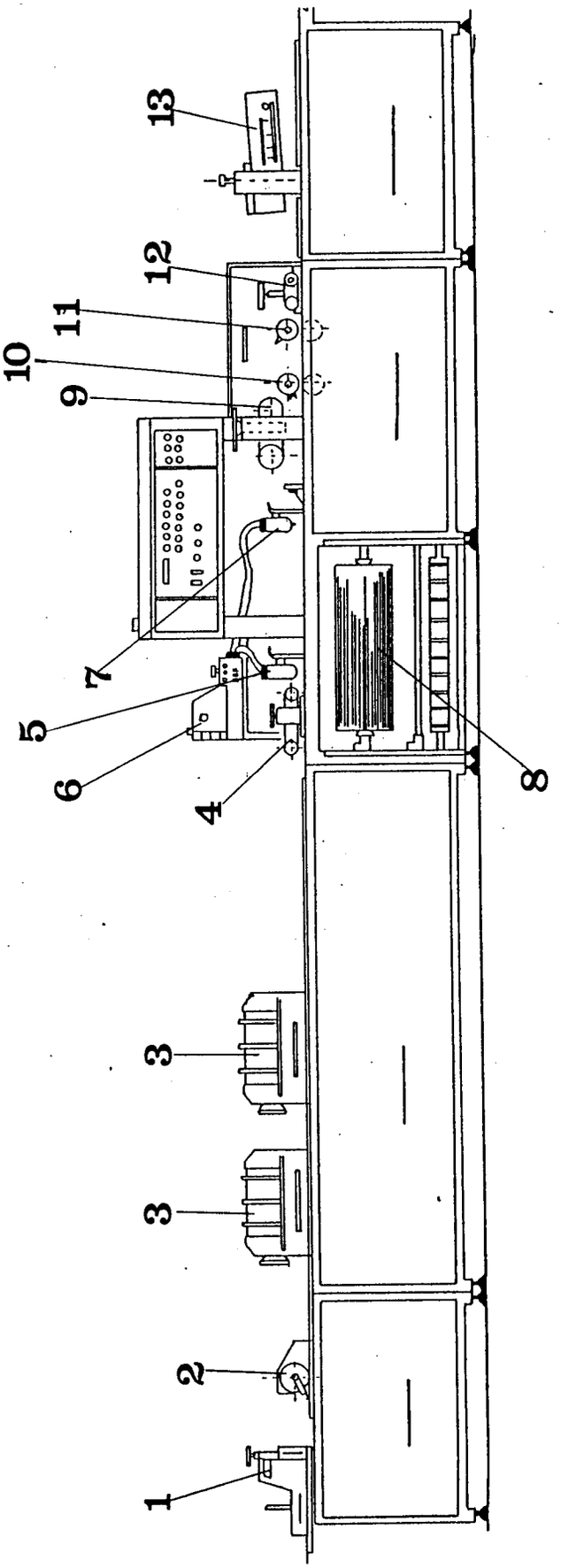

FIG 1

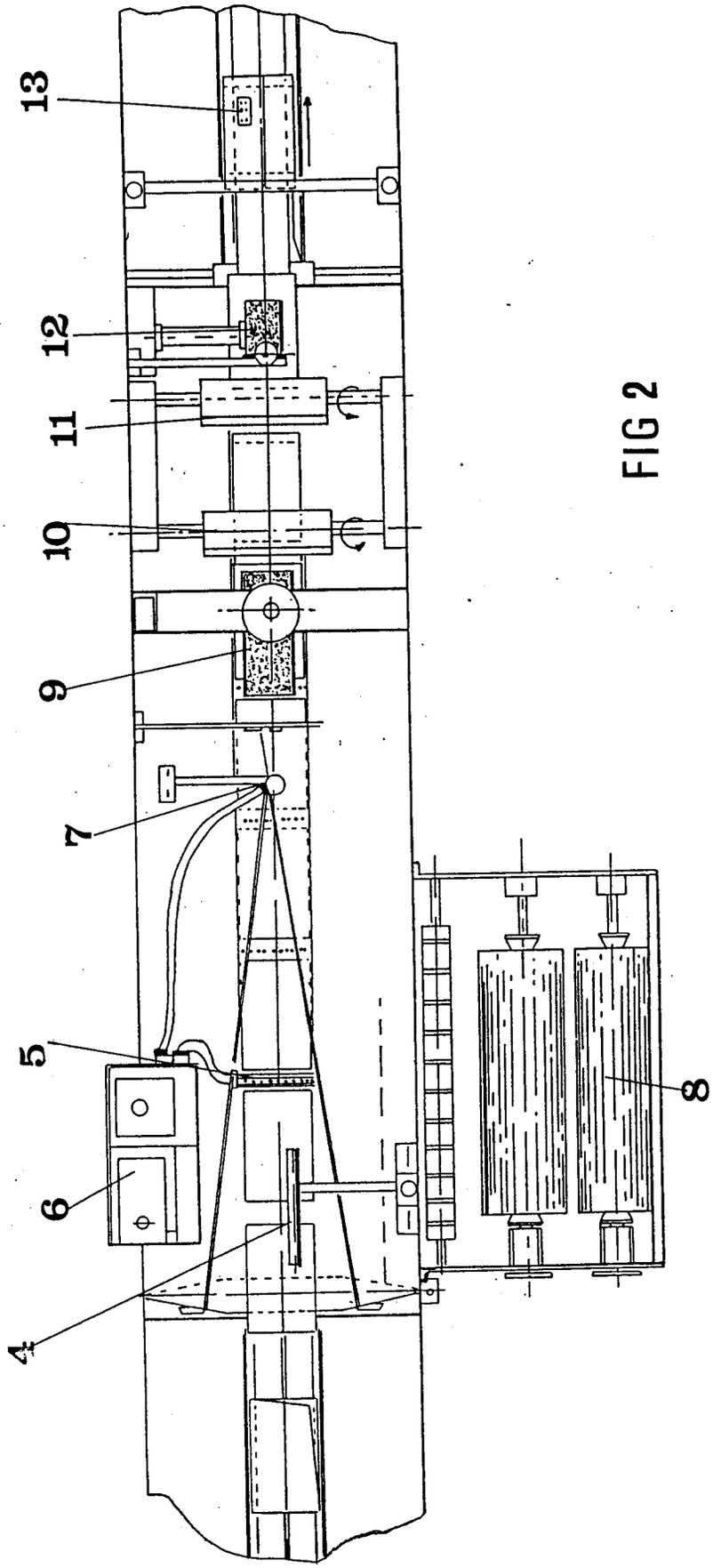

FIG 2

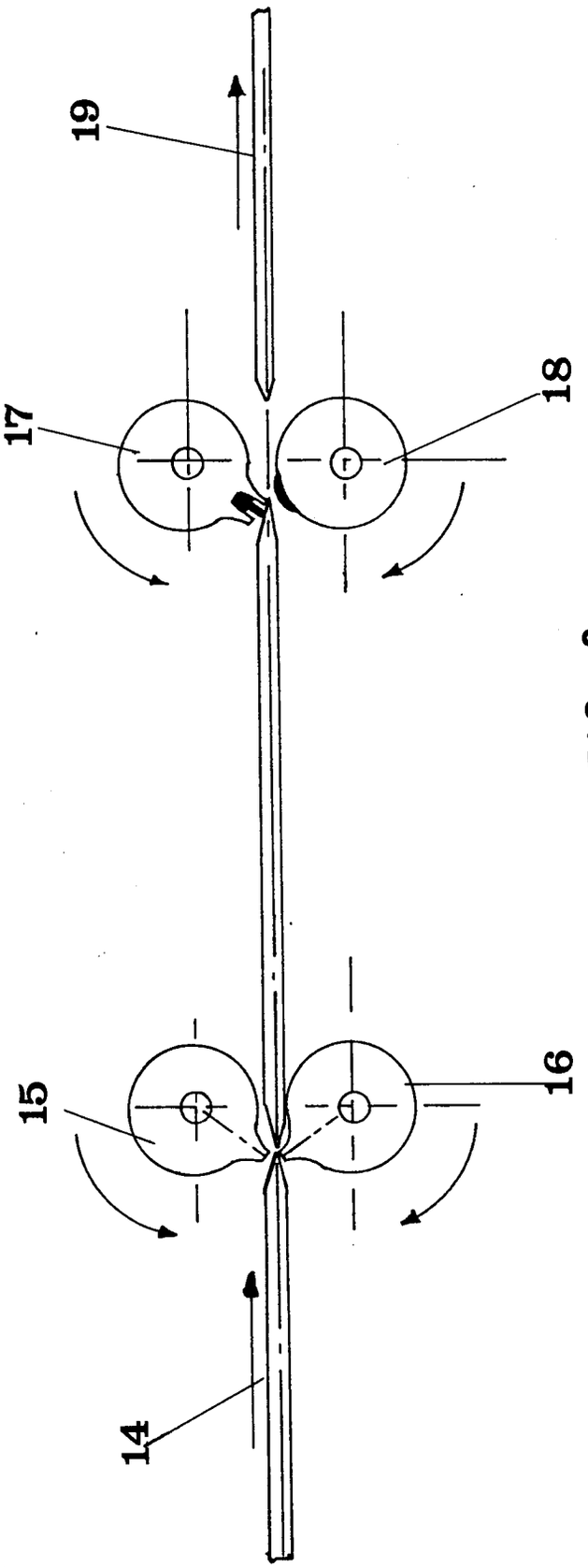

FIG 3

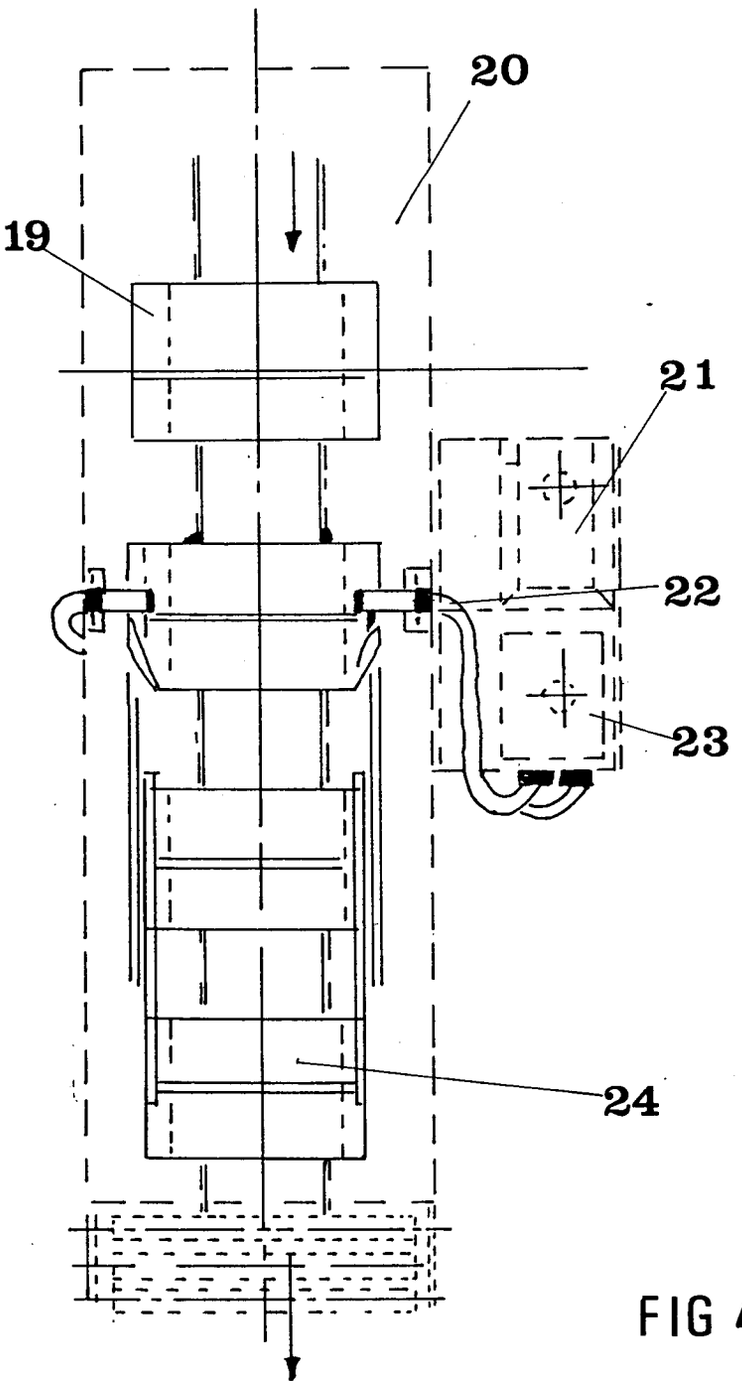

FIG 4

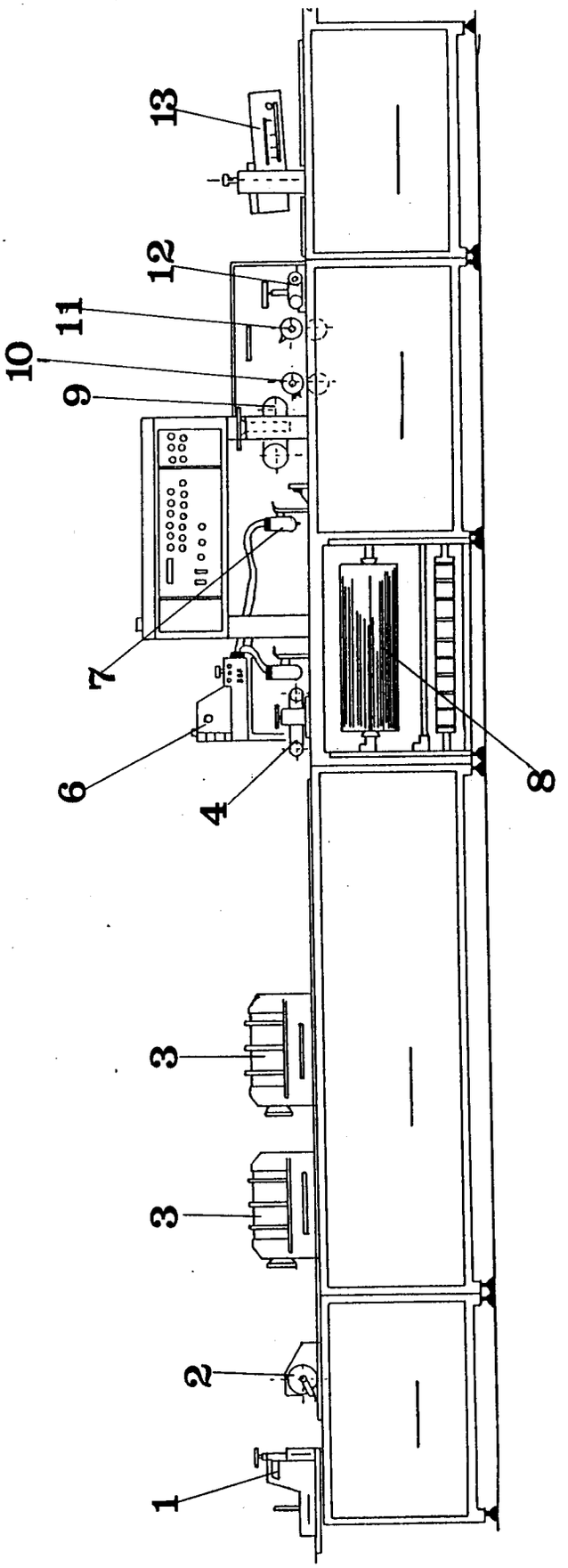

FIG 5

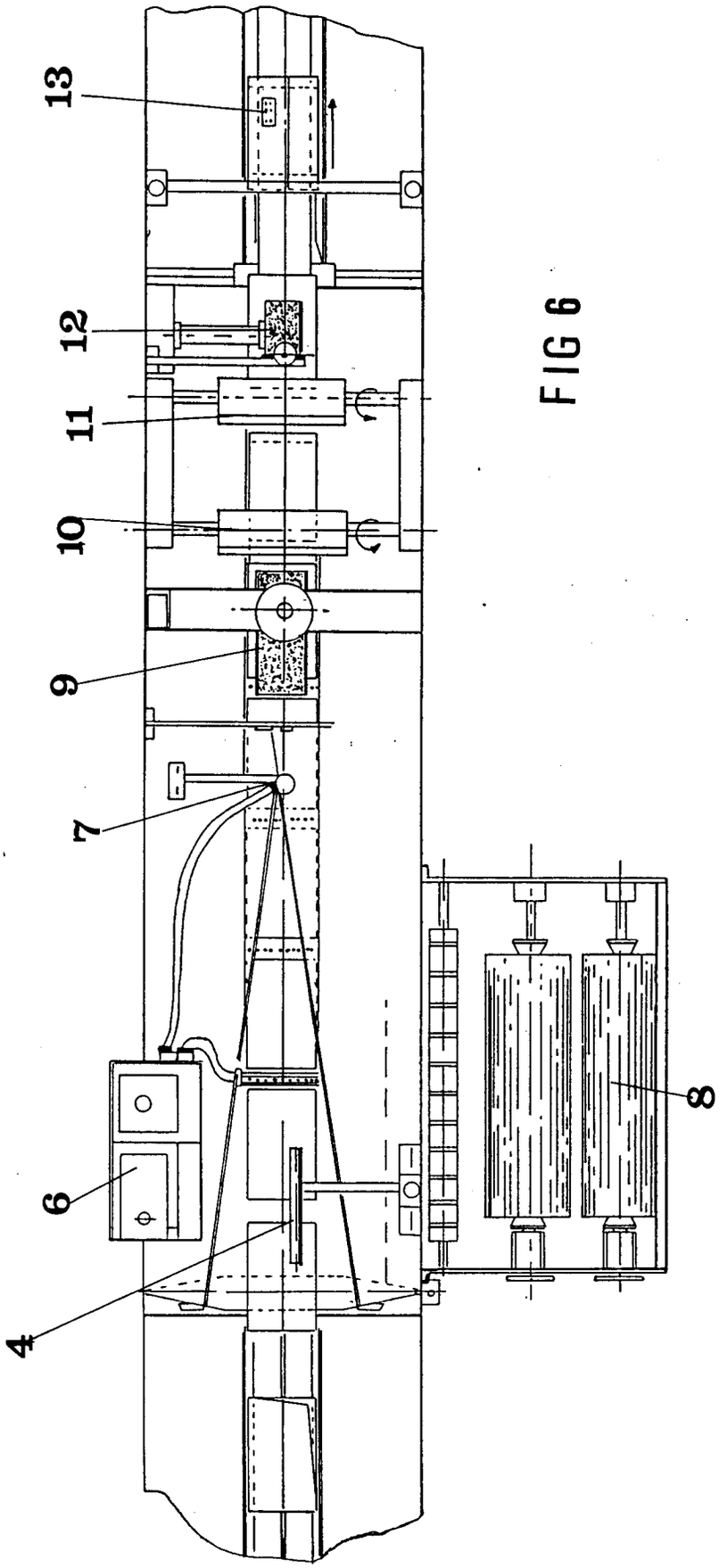

FIG 6

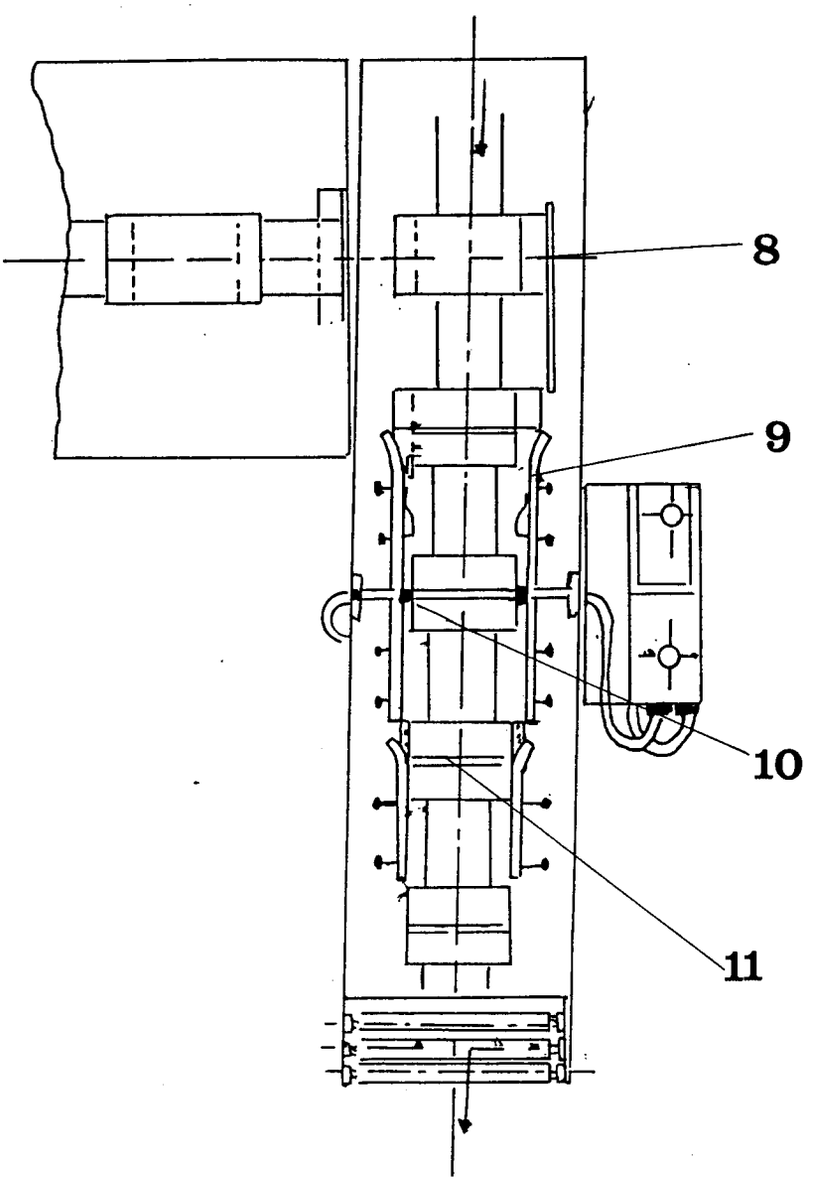

FIG 7

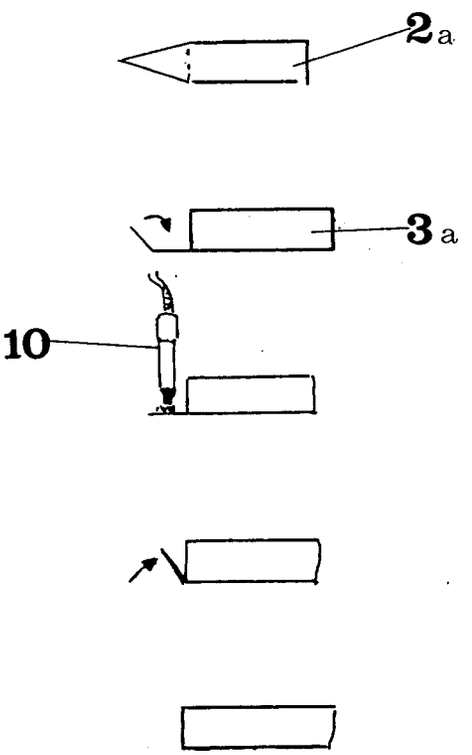

FIG 8