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

Maschine zum Umwickeln von Büchern, Zeitschriften und dergleichen mit Papier

Machine pour envelopper des livres, des périodiques et similaires avec du papier

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Description

For several years magazines and books have been sold in polyethylene wrappers, which are an effective means of protection from any damage which could occur during transportation.

A wrapping machine used to wrap these articles as well as similar articles, is described, for example, in the Italian patent no. 1.196.631 dated 19th September 1986, owned by C.M.C. S.r.l..

In this automatic machine magazines, or other similar objects, are taken one by one and wrapped in an PVC wrapper cut and sealed in proper manner.

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 designing of machines for wrapping newspapers, magazines and the like, with paper and other similar materials.

Patent document GB-A-222108 has for its object a machine intended for wrapping magazines, catalogues or other printed matters, with a wide band, closed and labelled.

The articles travel therein by stages, under control of two rows of transporting grippers. The wrapper paper is unwound across the path of the print that is advanced against the paper and inserted in a loop formed by the latter.

Then a knife cuts the paper off while the other end of the wrapper is supplied with gum by a gumming device and turned over upon the other extremity which has been curved by the combined action of raising and pressing devices so as to produce a tensioning of the band.

Lastly, the wrapped article is labelled and delivered.

The object of this invention is a totally automatic wrapping machine for newspapers, magazines, books and similar articles, which uses any kind of paper to wrap these articles and which works with a very high wrapping speed, performs two ways of gluing the edges of the wrapper lengthwise and offers the possibility of obtaining two different finishing, by modifying the end part of the machine, according to the following description. First of all, the machine includes a magazine drawing device, which takes the magazines, one by one, from a pile; this is followed, in sequence, by another device that 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 motorised presser belt aimed at keeping it at the right distance from the foregoing magazine, in a correct position.

While the magazines are kept at a fixed distance from

one another, a hot melt glue spraying device, controlled by photocells and an encoder, applies glue, crosswise, on the wrapping paper between two subsequent magazines.

5 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 glue spraying device applies glue lengthwise.

The magazine or other object then passes under a pressing pad and a transverse strip pressing roller which applies the necessary pressure on a crosswise strip between two magazine, previously glued, in order to stick crosswise the two layers of paper to each other. A cutting means then cuts the paper between the sequence of magazines, while a spacing out presser belt moves forward the magazines as soon as they are severed.

15 The following is a possible variation of the machine: the roll of paper may have preglued areas, thus making the hot gluing unnecessary. In this case the edges of the wrapping are stuck together simply by means of a high pressure.

20 If necessary it is also possible to obtain better finished packages by simply modifying the foregoing machine.

25 According to the following embodiment, the machine is exactly the same as the aforementioned one up to the paper unwinding device, the paper being still unrolled lengthwise under the object to be wrapped. The change concerns 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 glue spraying machine, controlled by photocells and an encoder, applies the glue lengthwise. The magazine or other object then passes under a pressing pad and a longitudinal press which applies the necessary pressure in order to ensure that the previously glued edges are effectively stuck to each other.

30 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.

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

55 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 transverse strip presser

and of the cutting means.

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

Fig. 5 shows a front view of a modified embodiment of the machine, without the first glueing device.

Fig. 6 shows a plan of the modified embodiment 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 includes 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 wrapping paper, or other similar material employed, consists of rolls (8), provided from 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 examples, which then pass, at a fixed distance the one from the other, under a motorised presser belt (4). A first hot-melt glue spraying device (5), controlled by photocells and an encoder, then applies two strips 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 a second glue spraying device (7), also controlled by photocells and encoder, sprays the glue lengthwise.

The longitudinal edges of the wrapping are then gradually closed one over the other, as the magazine advances along the line, where it passes under a pressing pad (9) and a transverse strip presser roller (15,16) which applies the necessary pressure to the strip between two magazines, so as to ensure that the two layers of paper, previously glued, effectively stick together. A cutting means (17, 18) then cuts the paper cross-wise, while a spacing out presser belt (12) move forward the magazines so as to space them out. 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 magazines and similar articles. In order to adapt it to larger object, such as books, a special unit (23) has been designed, this unit being shown in Figure 4.

The special unit (23) includes glue spraying devices (22) which apply glue along the sides of the packages parallel to the advancement direction.

The special unit (23) is placed at the end of the processing sequence, and receive magazines already in an open ended wrapping (19), carrying them forward beneath the two glueing machines (22) which spray a certain amount of glue on side surfaces of the package that is left free by e.g. the book.

Two folding blades (25) close the paper edges thus producing a wrapping that is well finished and also strong and resistant.

Any movement of the book, or other object contained in the package, is thus prevented.

Another version of this machine has been designed for enhancing the quality of the wrapping. The initial part of the machine remains unchanged with respect to the machine previously described, while in the terminal part a lateral glueing and folding unit (27) has been added, as shown in Figure 7, this unit performing the same task as the unit (23) previously described, but in a different way. The lateral glueing and folding unit (27) is in fact arranged perpendicular to the wrapping machine, and includes a first pair of folding blades (29), a couple of glue spraying devices (10) and a second pair of folding blades (30), set at a closer distance from each other with respect to the distance between the folding blades of the first pair.

The articles, already wrapped, are separated from one another by the cutting device that cuts the paper cross-wise leaving at each cross edge a suitable margin 2b, as shown in Figure 8.

Then each article 2a is transferred to the lateral glueing and folding unit (27) thus changing the advancement direction through an angle of 90 degrees.

In this way, as it is shown in Figure 8, the sides of the package still open, parallel to the advancement direction, advance along the longitudinal sides of the lateral glueing and folding unit (27), so that they are first engaged by the first pair of folding blades (29) which overfold them as shown in the second sketch, from above, of Figure 8.

Then the glue spraying devices (10) spray glue on the overfolded edges of the wrapped article (3a) and, lastly, the second pair of folding blades (30) fold again the edges making them adhere to the body of the package, as it is shown in the bottom sketch of Figure 8.

Use of the additional unit (27) allows provision of more complete or sophisticated device in accordance with the size of the articles to be packed.

Claims

1. A machine for paper wrapping newspapers, magazines and similar articles, the said machine including an article drawing device (1) which takes the articles one by one from a pile, and an unwinding device providing the paper wrapping material from rolls (8) and setting it under the articles, the machine being characterised in that it includes the combination of:

a motorised presser belt (4) which keeps the

articles at the right distance one from the other;
 a hot-melt glue spraying device (5) that applies
 a strip of glue cross-wise onto the paper
 between one article and the following one;
 a further glue spraying device (7) that applies
 glue lengthwise over the edges of the wrapping
 sheet of papers folded towards the centre over
 the article;

two folding blades that gradually close the
 edges of the wrapping sheet over each other;
 a pressing pad (9) and a transverse strip
 presser roller means (15,16) that presses the
 glued strip of the wrapping sheet of paper
 between each pair of articles;

a cutting means (17,18) which cuts the sheet of
 paper cross-wise between each article and the
 following one;

a moving apart belt (12) that moves apart each
 wrapped articles from the following one.

2. A paper wrapping machine as in claim 1, character-
ised in that the paper wrapping material is provided
 by rolls (8) situated in the lower part of the machine
 and provided with a lateral unwinding device.

3. A paper wrapping machine as in claim 1, character-
ised in that the first hot-melt glue spraying device
 (5) and the second glue spraying device (7) are
 controlled by means of respective photocells and
 encoders.

4. A paper wrapping machine as in claim 1, character-
ised in that it further includes an opening device (2),
 which opens the first page of each newspaper,
 magazine or similar article, and one or more feed-
 ers (3) which introduce an insert in the opened
 newspaper, magazine or similar article.

5. A paper wrapping machine as in claim 1, character-
ised in that it includes a special unit for wrapping
 larger articles (19), said unit including two auxiliary
 glue spraying devices (22), designed to spray glue
 sidewise on the edges of a package, containing a
 larger article (19) already in a open ended wrap-
 ping, that is left free by the said article (19), and two
 folding blades which fold the said edges to com-
 plete the package.

6. A paper wrapping machine as in claim 1, character-
ised in that it further includes a lateral gluing and
 folding unit (27) arranged perpendicularly with
 respect to the wrapping machine, so that the news-
 papers, magazines and similar articles, while pass-
 ing from the machine to the lateral gluing and
 folding unit, change the advancement direction and
 the transverse edges of the newspapers, maga-
 zines and similar articles, provided with a suitable
 margin (2b), advance along the sides of the lateral
 gluing and folding unit (27) and are first folded by a

first pair of folding blades (29), then glued by glue
 spraying devices (10) and lastly folded by a second
 pair of blades (30) which are set at a closer dis-
 tance from each other with respect to the distance
 between the folding blades of the first pair.

Patentansprüche

1. Maschine zum Einwickeln mit Papier von Zeitun-
 gen, Zeitschriften und ähnlichen Artikeln, wobei die
 genannte Maschine eine Artikelentnahmeverrich-
 tung (1) umfaßt, welche die Artikel einzeln von
 einem Stapel aufnimmt, sowie eine Abwickelvor-
 richtung, welche das Papiereinwickelmaterial von
 Rollen (8) abzieht und unter den Artikeln anordnet;
 die Maschine ist dadurch gekennzeichnet ist, daß
 sie folgendes umfaßt:

ein motorisch angetriebenes Andrückband (4),
 welches die Artikel im passenden Abstand von-
 einander hält; eine Heißeimsprühvorrichtung
 (5), mit der ein Streifen Leim quer auf dem
 Papier zwischen einem und dem folgenden
 Artikel aufgetragen wird;

eine weitere Leimsprühvorrichtung (7), welche
 den Leim längsseits an den Rändern des zur
 Mitte hin über den Artikel gefalteten Einwickel-
 papierbogens aufträgt;

zwei Faltelemente, welche die Ränder des Ein-
 wickelbogens schrittweise übereinander
 schließen;

einen Andrückstempel (9) und querseitige
 Streifenanpreßrollen (15,16), welche den
 geleimten Streifen des Einwickelpapierbogens
 zwischen jedem Artikelpaar anpressen;

Schneidemittel (17,18), welche den Papierbo-
 gen zwischen einem Artikel und dem folgenden
 in Querrichtung trennen;

ein Abfuhrband (12), das jeden eingewickelten
 Artikel vom folgenden wegfährt.

2. Maschine zum Einwickeln mit Papier gemäß
 Patentanspruch 1, dadurch gekennzeichnet, daß
 das Papiereinwickelmaterial durch Rollen (8) zuge-
 führt wird, die sich im unteren Teil der Maschine
 befinden und mit einer seitlichen Abwickelvorr-
 richtung versehen sind.

3. Maschine zum Einwickeln mit Papier gemäß
 Patentanspruch 1, dadurch gekennzeichnet, daß
 die erste Heißeimsprühvorrichtung (5) und die
 zweite Leimsprühvorrichtung (7) durch entspre-
 chende Fotozellen und Geber gesteuert werden.

4. Maschine zum Einwickeln mit Papier gemäß
 Patentanspruch 1, dadurch gekennzeichnet, daß
 sie zusätzlich eine Öffnungsvorrichtung (2) umfaßt,
 welche die erste Seite einer jeden Zeitung, Zeit-
 schrift oder ähnlichem Artikel öffnet, sowie einen

oder mehrere Eingabevorrichtungen (3), welche eine Beilage in die geöffnete Zeitung, Zeitschrift oder ähnlichen Artikel einführen.

5. Maschine zum Einwickeln mit Papier gemäß Patentanspruch 1, dadurch gekennzeichnet, daß sie außerdem eine spezielle Einheit zum Einwickeln größerer Artikel (19) umfaßt, wobei diese Einheit zwei zusätzliche Leimsprühvorrichtungen (22) zum Leimauftrag seitlich auf den Rändern einer Packung umfaßt, welche einen bereits eingewickelten größeren Artikel (19) enthält, wobei der genannte Artikel (19) das Ende des Wickels freiläßt, sowie aus zwei Faltelementen, welche die genannten Ränder falten, um die Packung zu vervollständigen.
6. Maschine zum Einwickeln mit Papier gemäß Patentanspruch 1, dadurch gekennzeichnet, daß sie außerdem eine seitliche Leim- und Falteinheit (27) umfaßt, welche rechtwinklig zur Einwickelmaschine angeordnet ist, so daß die Zeitungen, Zeitschriften und ähnlichen Artikel während der Übergabe von der Maschine zur seitlichen Leim- und Falteinheit die Laufrichtung ändern und die Querränder der Zeitungen, Zeitschriften und ähnlichen Artikel, versehen mit einem passenden Rand (2b), an den Seiten der seitlichen Leim- und Falteinheit (27) entlangfahren und erst mit einem ersten Faltelementepaar (29) gefaltet, dann durch die Leimsprühvorrichtungen (10) beleimt und schließlich mit einem zweiten Faltelementepaar (36) gefaltet werden, wobei der Abstand zwischen letzteren Faltelementen kleiner ist als beim ersten Faltelementepaar.

Revendications

1. Une emballeuse à papier pour l'emballage de journaux, magazines et produits similaires, composée d'un dispositif entraîneur d'articles (1) qui prend les articles un par un sur une pile, et un dispositif dérouleur qui déroule le matériau de papier d'emballage disposé sur des rouleaux (8) et les place sous les articles ; ladite machine étant caractérisée en ce qu'elle comprend :
- un compresseur à bande motorisé (4) qui permet de garder une distance déterminée entre les articles ;
- un dispositif pulvérisateur de colle thermofusible (5) qui applique une bande de colle transversalement sur le papier situé entre un article et le suivant ;
- un autre dispositif pulvérisateur de colle thermofusible (7) qui applique une bande de colle en longueur sur les bords des feuilles de papier d'emballage qui sont pliées vers le centre sur les articles ;

deux lames plieuses qui plient graduellement les bords des feuilles d'emballage les unes sur les autres ;

un plaque de presse (9) et des rouleaux pour comprimer les bandes transversales (15, 16) qui compriment la bande de colle de la feuille de papier d'emballage située entre deux articles ;

un élément de coupage (17, 18) qui coupe la feuille de papier transversalement entre un article et le suivant ;

une séparateur à bande (12) qui sépare les articles enveloppés.

2. Une emballeuse à papier selon la revendication 1, caractérisée en ce que le matériau de papier d'emballage est fourni par des rouleaux (8) situés sur la partie inférieure de la machine qui sont déroulés par un dispositif dérouleur latéral.
3. Une emballeuse à papier selon la revendication 1, caractérisée en ce que le premier dispositif pulvérisateur de colle thermofusible (5) et le deuxième dispositif pulvérisateur de colle thermofusible (7) sont commandés par des cellules photoélectriques et des encodeurs.
4. Une emballeuse à papier selon la revendication 1, caractérisée en ce qu'elle comprend également un dispositif ouvreur (2) qui ouvre la première page de chaque journal, magazine et article similaire, et un alimenteur (3) qui introduit un encart dans le journal, magazine, ou article similaire ouvert.
5. Une emballeuse à papier selon la revendication 1, caractérisée en ce qu'elle comprend un groupe supplémentaire pour l'emballage d'articles de grande taille (19). Le groupe en question comprend deux dispositifs pulvérisateurs de colle auxiliaires (22), destinés à pulvériser de la colle en longueur sur les bords d'un paquet, contenant un article de grande taille (19) qui se trouve déjà dans un emballage ouvert à une extrémité, laissée libre par ledit article (19), et deux lames plieuses qui plient lesdits bords pour terminer l'emballage.
6. Une emballeuse à papier selon la revendication 1, caractérisée en ce qu'elle comprend un autre groupe de pliage et de collage latéral (27) placé perpendiculairement par rapport à l'emballeuse à papier, de manière à ce que la direction d'avance des journaux, magazines et articles similaires change lorsqu'ils qu'ils passent de la machine au groupe de collage et de pliage latéral, et que les bords transversaux des journaux, magazines et articles similaires, possédant une marge correcte (2b), avancent le long des côtés du groupe de collage et de pliage latéral (27) et soient d'abord pliés par une première paire de lames plieuses (29), puis

collés par des dispositifs pulvérisateurs de colle (10), et enfin pliés par une deuxième paire de lames (30), séparées par une distance inférieure par rapport à celle existant entre les lames plieuses de la première paire.

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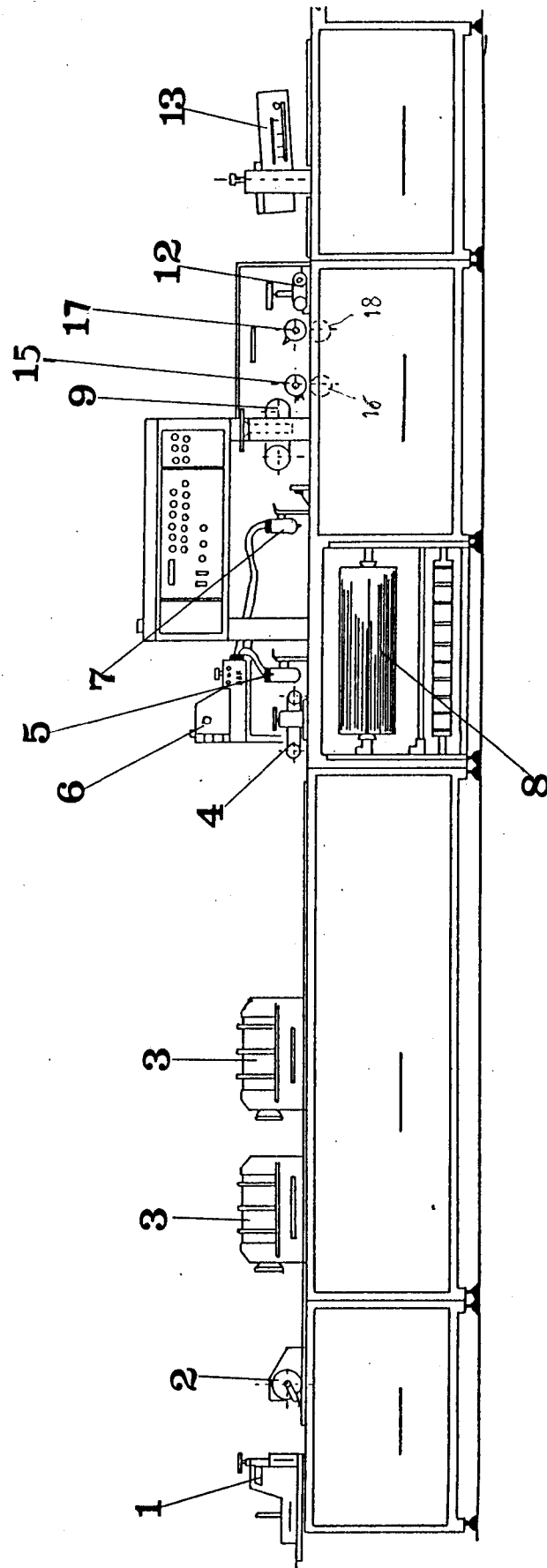
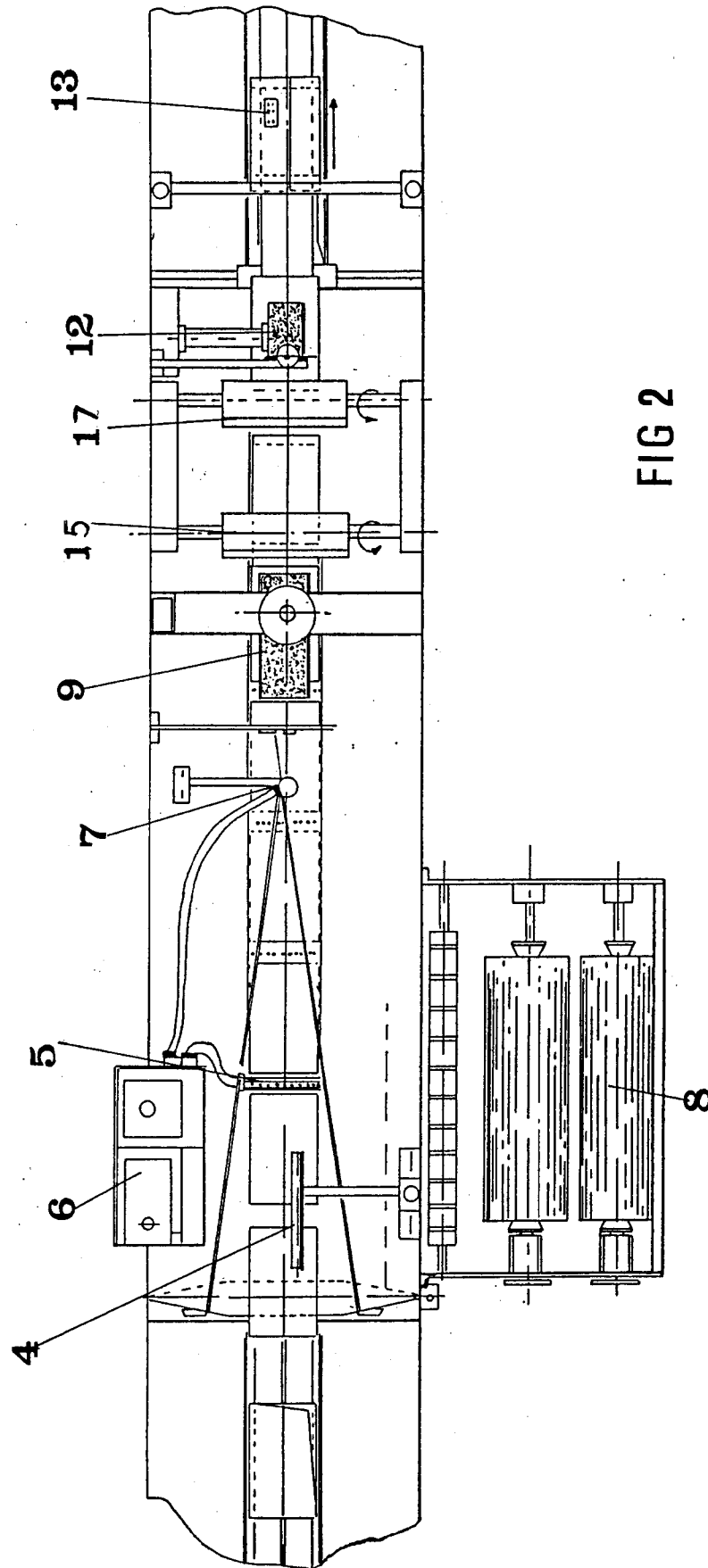


FIG 1



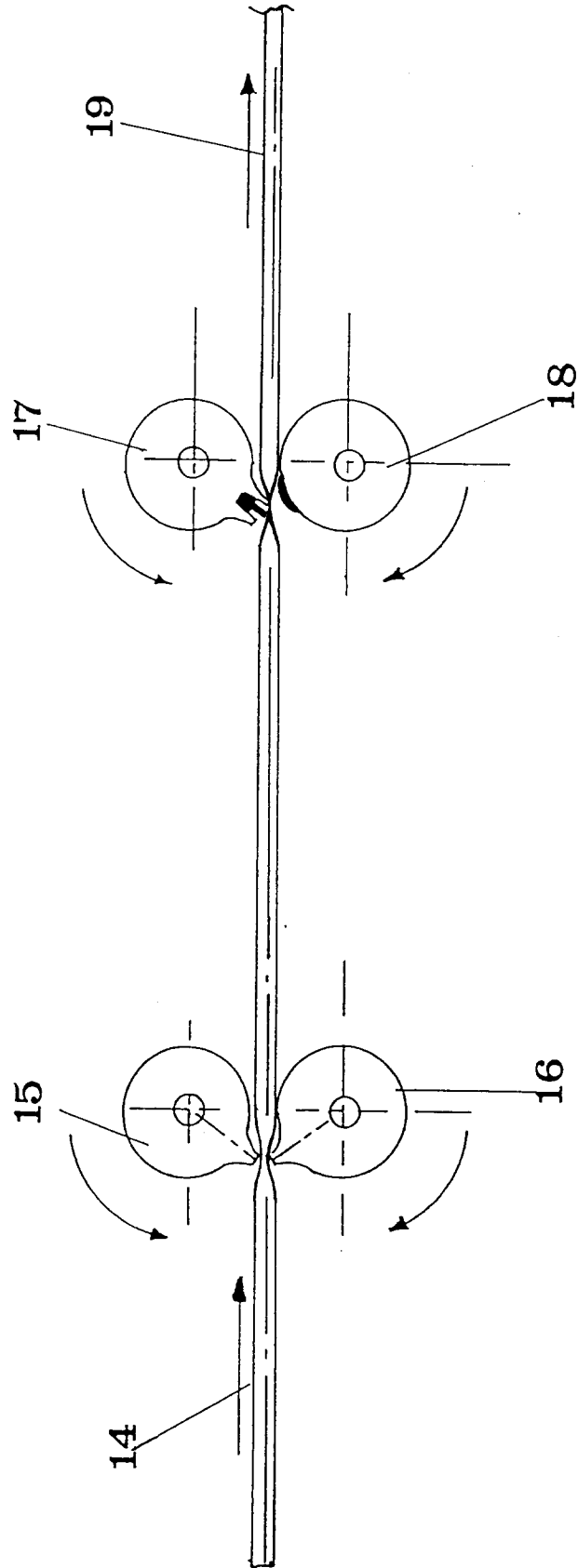


FIG 3

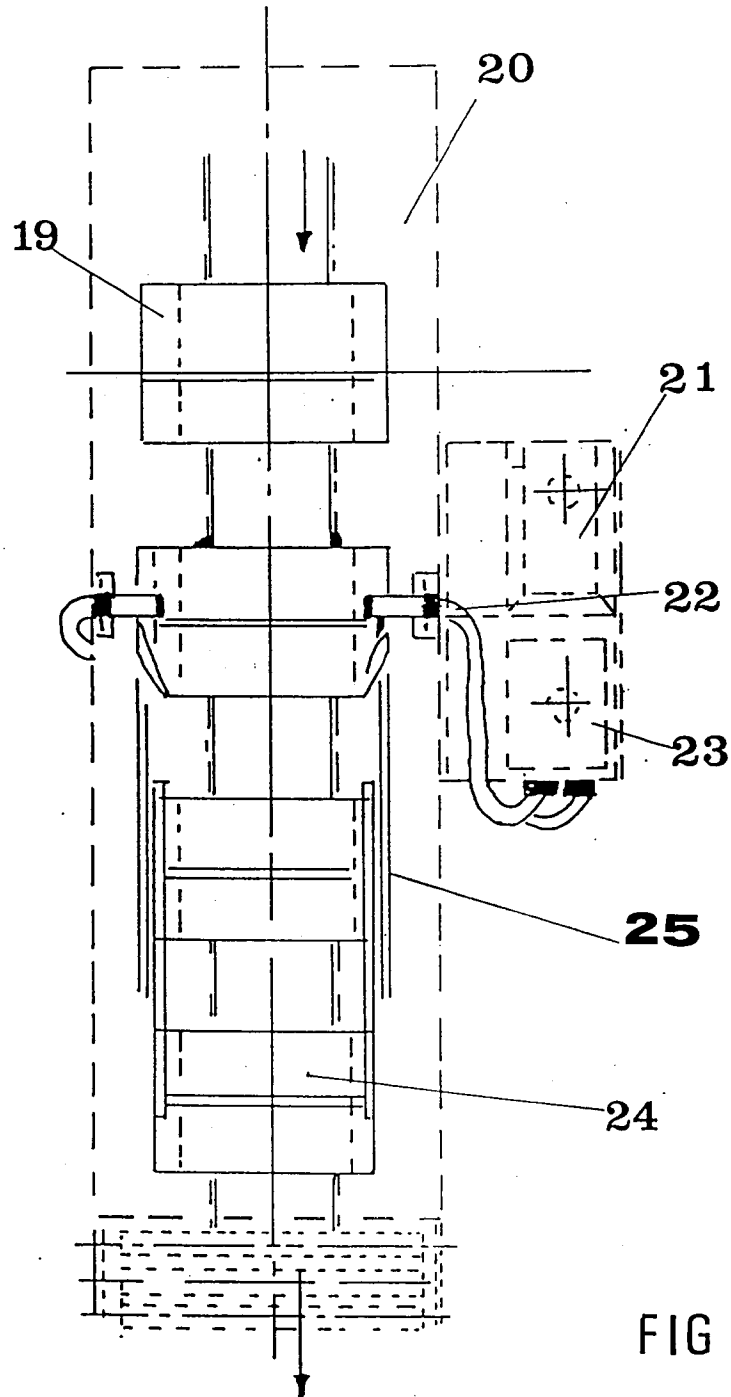


FIG 4

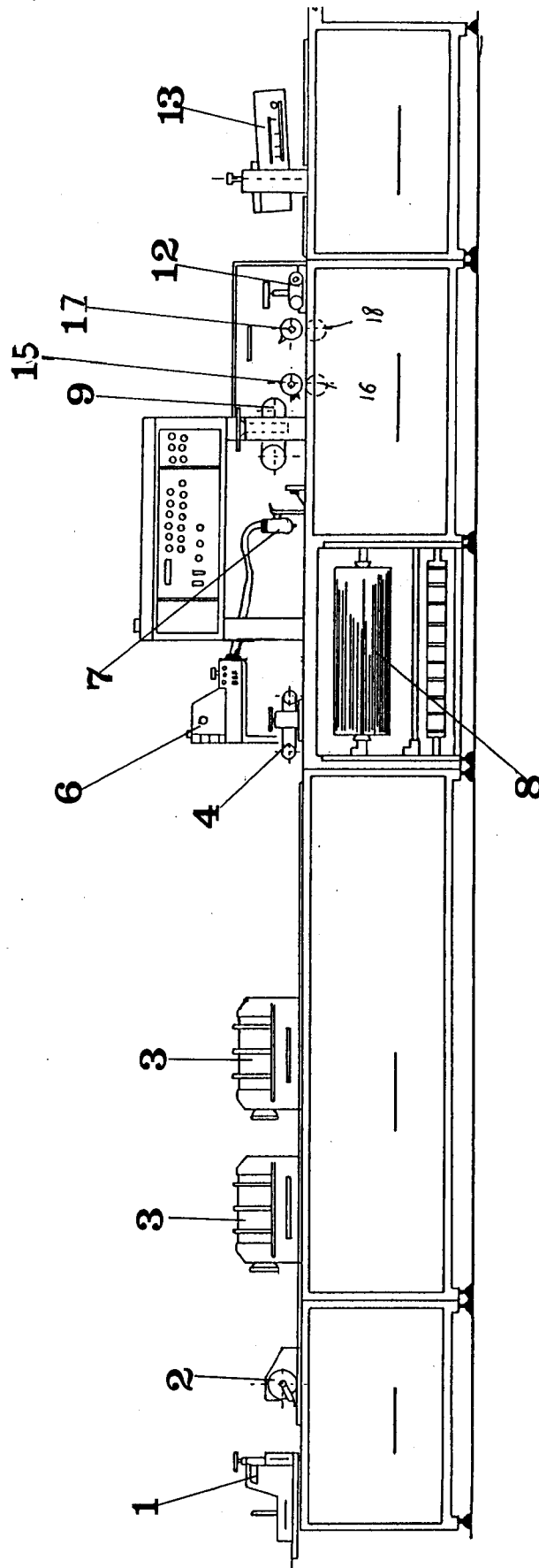
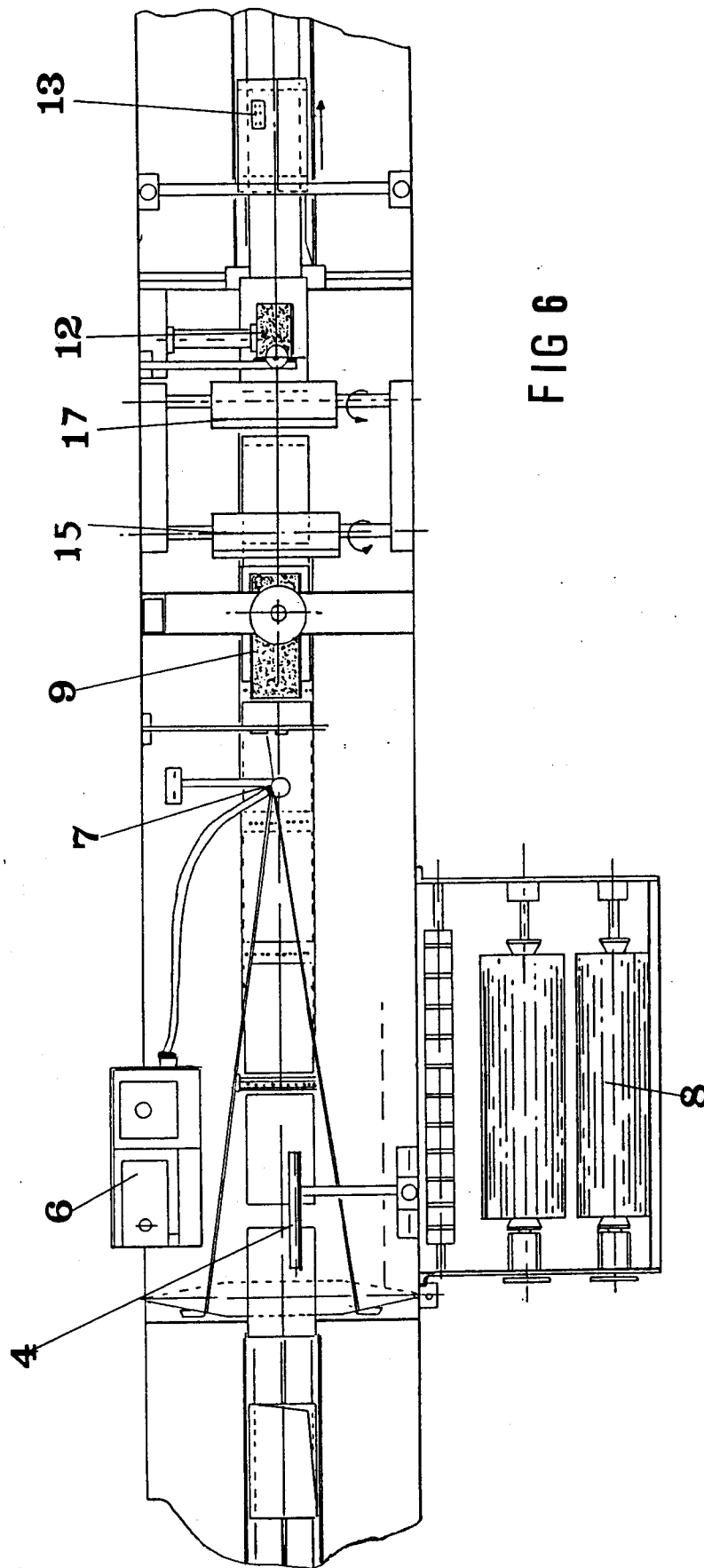


FIG 5



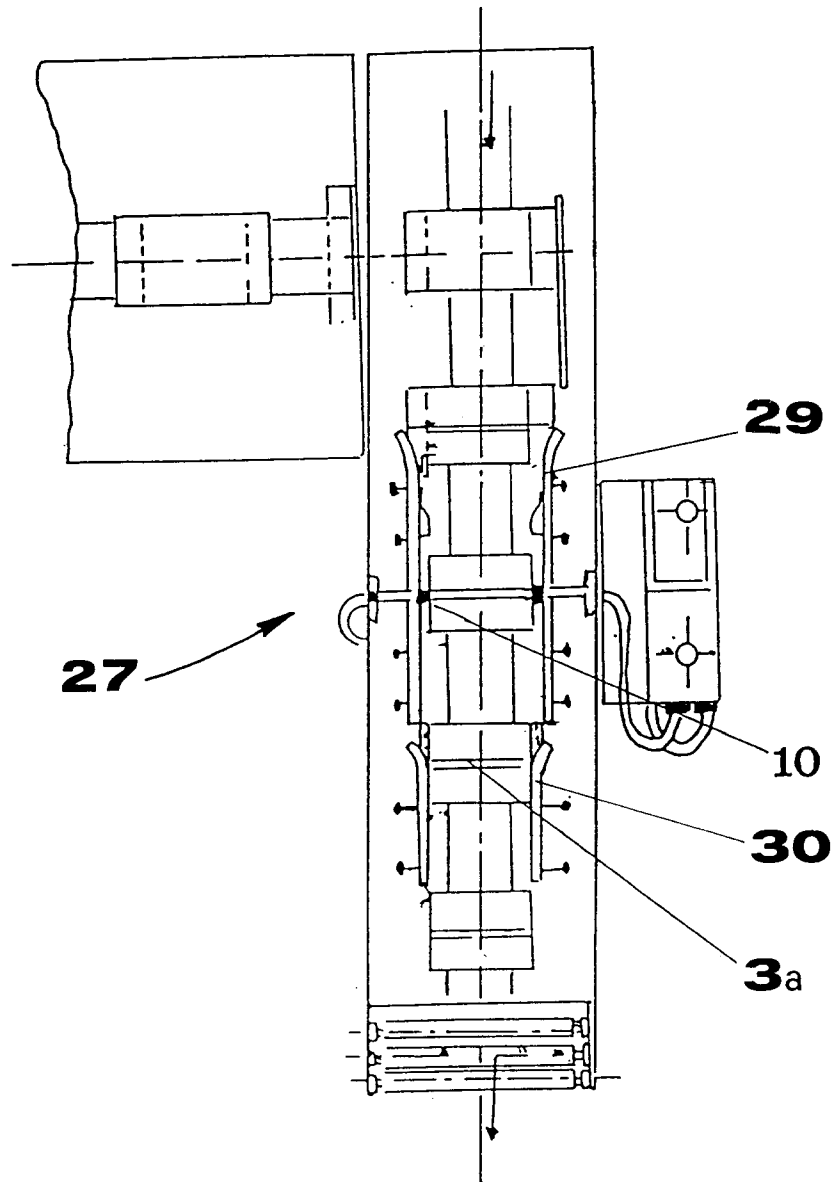


FIG 7

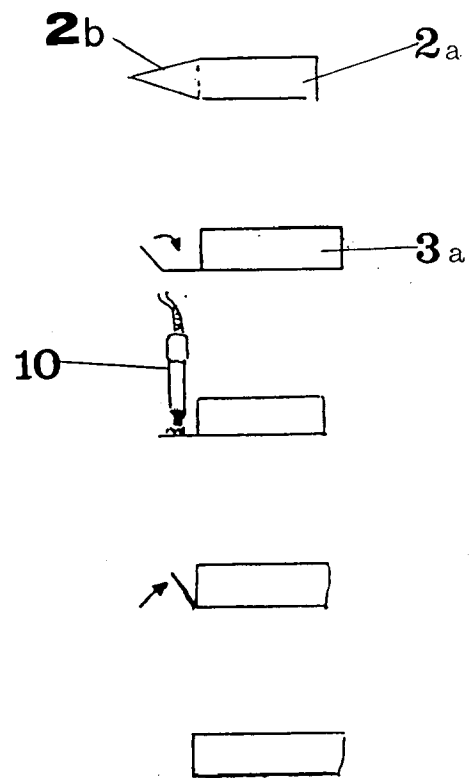


FIG 8