

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : B31B 19/86	A1	(11) International Publication Number: WO 93/10968 (43) International Publication Date: 10 June 1993 (10.06.93)
---	----	--

(21) International Application Number: PCT/IT91/00107

(22) International Filing Date: 6 December 1991 (06.12.91)

(71) Applicant (for all designated States except US): CURIONI SUN S.R.L. [IT/IT]; Zona Industriale Mazzoni, Frazione S. Atto, I-64100 Teramo (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only) : MACCALLI, Giacomo [IT/IT]; Via Gera d'Adda, 5, I-20075 Lodi (IT).

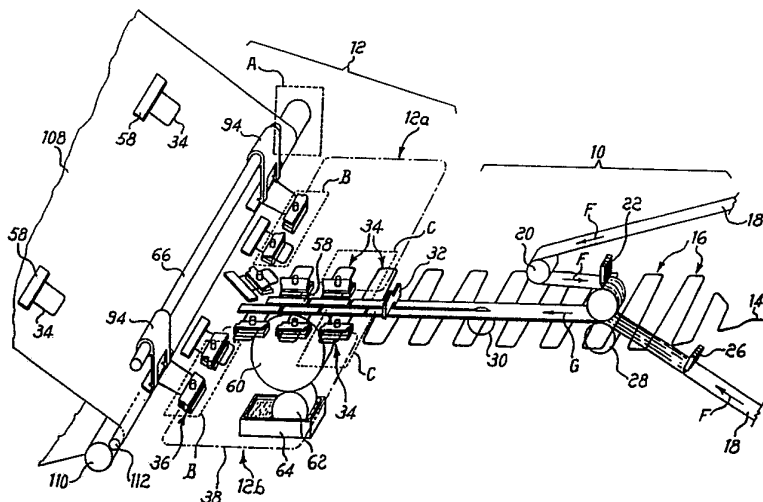
(74) Agents: ADORNO, Silvano; Società Italiana Brevetti, Via Carducci, 8, I-20123 Milano (IT) et al.

(81) Designated States: BR, CA, FI, JP, KR, NO, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE).

Published

With international search report.

(54) Title: APPARATUS FOR FORMING AND APPLYING HANDLES TO BAGS



(57) Abstract

Apparatus for carrying rope handles for paper bags to a forming station thereof wherein said handles are supplied to the bags at the entrance of said station before forming the bags. Said apparatus comprises a first and a second plurality of means (36) for gripping said handles (34) fed by a forming station thereof, said first and said second plurality of gripping means (36) being arranged substantially side by side at the entrance of the bag forming station towards which they move forward as far as the correspondence with at least one pair of units (94, 98, 104) for taking the handles (34), there being provided means (70, 78, 88, 92) to control the inhibition of the gripping means (36) and the actuation of the units (94, 98, 104) for taking the handles (34) from said gripping means (36) so that said handles (34) are fed to the paper bag forming station.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	MR	Mauritania
AU	Australia	GA	Gabon	MW	Malawi
BB	Barbados	GB	United Kingdom	NL	Netherlands
BE	Belgium	GN	Guinea	NO	Norway
BF	Burkina Faso	GR	Greece	NZ	New Zealand
BG	Bulgaria	HU	Hungary	PL	Poland
BJ	Benin	IE	Ireland	PT	Portugal
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SK	Slovak Republic
CI	Côte d'Ivoire	LJ	Liechtenstein	SN	Senegal
CM	Cameroon	LK	Sri Lanka	SU	Soviet Union
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	MC	Monaco	TG	Togo
DE	Germany	MG	Madagascar	UA	Ukraine
DK	Denmark	ML	Mali	US	United States of America
ES	Spain	MN	Mongolia	VN	Viet Nam
FI	Finland				

- 1 -

Apparatus for forming and applying handles to bags.

5 The present invention relates to an apparatus for carrying rope handles for paper bags to a forming station thereof wherein said handles are applied to the bags at the entrance of said station before forming the bags.

10 It is known that rope handles for paper bags, made either of synthetic or vegetable material, consist of a portion of rope, essentially U-bent, whose ends are bound between two rectangular paper sheets, overlapped and stucked to each other.

15 Said handles are usually automatically applied inside the machine which manufactures paper bags before the formation thereof, i.e. when the paper strip for forming the bag is still spread out.

 Generally apparatuses for making paper bags
20 with rope handles comprise, essentially, a station for forming said handles continuously feeding a station for carrying them at the entrance of the bag forming station. A suitable means, to be dealt with hereinafter, causes the handles, particularly the
25 rectangular sheets holding the rope ends, to be stucked on the still spread out strip to be used later for the paper bag formation.

 Traditional apparatuses, whose basic structure has been briefly described hereinabove, have remarkable drawbacks deriving either from their considera-
30

SUBSTITUTE SHEET

- 2 -

ble encumbrance that makes difficult and sometimes impossible the installation at premises of users having little room available, or from the way in which such apparatuses apply handles to the paper strip, such an application resulting difficult and complex to be accomplished and substantially scarcely reliable.

The first of the above mentioned drawbacks mainly derives from the fact that the glue that will allow the binding of handles to the strip from which bags will be obtained, is applied on the latter in predetermined areas corresponding to those for the binding of handles. This operation is accomplished by suitable rotating rollers, one of which applies the glue on the strip when required, while the other actuates only a backing action. As the handles to be applied are two for each bag, there will be necessary to provide two units of rollers for smearing glue on the strip, arranged substantially side by side, each unit being provided with its own control and actuation means. The presence of these units makes considerable the machine encumbrance taking also into account that the strip slides between them shifting upward until a not negligible height which depends on the total height of the glue applying rollers. Thus there becomes necessary the realization of a suitable casing in the upper part of which all the different parts are arranged which accomplish the binding of handles to the strip. These latter parts must be actuated in perfect synchronism with the feeding of strip to apply the handles exactly in the pre-glued

SUBSTITUTE SHEET

- 3 -

areas. It is clear that in case of adjustment of said parts, for instance due to a variation of the distance between the handles deriving from a different width of the bag, or for maintenance works, the personnel must reach the upper part of said casing which must be therefore provided with ladders.

Besides the hereinabove described drawback of the encumbrance in height, the known apparatus has also a considerable transversal encumbrance as the overlapped and stucked paper strips on which the ends are fixed of the substantially U-bent rope from which handles will be later obtained, are supplied transversally to the strip from which bags will be obtained, from both sides of the strip. It is clear that all apparatuses accomplishing the formation of said strips from which handles will be obtained add a considerable side encumbrance to the bag forming station.

The application of glue on the strip from which bags will be obtained involves problems as such an application must be accomplished at well defined time intervals, i.e. it must be "in phase" depending on the speed of the strip from which bags will be obtained, and depending on the "pitch", i.e. the length of the bag. Thus the cylinders applying glue on the strip must work in perfect synchronism with the means controlling the feeding of the strip and the means for applying handles.

The application of glue on the strip from which bags will be obtained is at present accomplished according to two different techniques which however

SUBSTITUTE SHEET

- 4 -

do not give particularly reliable results.

A first technique consists in using electronically controlled spraying devices, but such devices do not assure a regular glue smearing and thus it is
5 not certain that the handle will remain perfectly adherent to the strip.

A second technique provides the use of a mechanical glueing device but such a device requires long times for its setting to approach a correct working,
10 particularly due to the choice of the gear ratios of the means controlling its actuation and the correct synchronization with the strip feeding.

It has been now devised, and forms the object of the present invention, an apparatus of the afore-
15 said type which allows to eliminate all the drawbacks of the traditional apparatuses.

Therefore one of the main objects of the present invention is to provide an apparatus by which the carrying of the handles towards the bag forming
20 station is accomplished by using means whose motion takes place substantially at man height thus reducing the apparatus encumbrance in height.

Another object of the present invention is to provide an apparatus by which the handle glueing onto
25 the strip from which bags will be obtained is extremely reliable mainly because glue is applied on the handles and not on said strip.

A further object of this invention is to provide an apparatus in which the handle glueing takes
30 place while the handles are carried towards the bag forming station with extreme simplification of the

SUBSTITUTE SHEET

- 5 -

apparatus.

Still another object of this invention is to provide an apparatus in which the handles, once they have glue on a face thereof, are simply transferred
5 onto the strip from which bags will be obtained and applied thereon thus eliminating the problems of synchronization present in the traditional apparatuses.

These and further objects as well as advantages of the apparatus according to the present invention
10 will be clear from the following detailed description of a non-limiting embodiment thereof, made with reference to the attached drawings in which:

FIGURE_1 is a schematic perspective view showing the apparatus according to the present invention,
15 there also being represented the handle forming station;

FIGURE_2 is a plan view showing a mechanism for controlling the handle carrying means, that is not represented in fig.1 but is arranged in the positions indicated by C-areas on the same figure;
20

FIGURES_3, 4 and 5 are side views showing the mechanism of fig.2 in its different operating steps;

FIGURE_6 is a side view showing as a whole the mechanisms for controlling handle motion as well as
25 those for transferring the handles to the bag forming station; said mechanisms are not represented in fig.1 for the sake of clearness and are respectively arranged in the zones indicated by the areas A and B in the same figure;

30 FIGURE_7 is a view similar to fig.6 showing the above mentioned mechanisms in an operating step

SUBSTITUTE SHEET

- 6 -

successive to that of fig.6;

FIGURE_8 is a view similar to fig.7 showing the above mentioned mechanisms in an operating step successive to that represented in fig.7; and

5 FIGURE_9 is a schematic side view substantially corresponding to fig.6 and showing a different implementation of the mechanism for controlling the means for transporting handles to the bag forming station.

With reference at first to fig.1 it is described as a whole an apparatus for the forming of rope handles and for their application to a paper strip from which bags will be obtained, while taking into account that the present invention relates to the part of said apparatus regarding the feed of handles to the bag forming station and their application to the paper strip from which the bags will be obtained.

10 With reference to said figure it is referenced as a whole by 10 the rope handle forming station, downstream of which there is arranged, referenced as a whole by 12, the apparatus according to the present invention as hereinabove defined.

As it is known a rope handle for paper bags essentially consists of a portion of rope having a certain length, substantially U-bent whose ends are bound by two rectangular paper sheets overlapped and stucked to each other, forming the part of handle to be stucked on the bag.

In the station designated 10 in fig.1 said handles are formed as hereinafter described.

30 From a first feeding station neither represented nor described as it is per se known, a rope 14,

SUBSTITUTE SHEET

- 7 -

is fed made of synthetic or vegetable material, which, by means of known devices not represented, is caused to assume a substantially zig-zag shape essentially consisting of successive portions 16 which are substantially U-shaped. Each portion 16 is oppositely folded with respect to the following one to obtain, with respect to a median longitudinal line cutting on the zig-zag bent rope, two pluralities of handles which will be fed to two pluralities of means for carrying and applying handles as hereinafter described.

From a second feeding station also neither represented nor described, as per se known, two paper strips 18 are fed having quite reduced width and moving according to the direction of arrows F in fig.1.

The paper strip 18 coming from above is caused to pass at first on a transmission roller 20 and, after a glue layer has been applied thereon by a known glueing device 22, is caused to pass on a pressing roller 24 which is clockwise rotatably supported by the apparatus casing.

The strip 18 coming from below, after a glue layer has been applied thereon by a known glueing device 26, is caused to pass on a pressing roller 28 arranged under the pressing roller 24 and cooperating therewith. In particular the pressing roller 28 is counter-clockwise rotatably supported by the apparatus casing.

Thanks to pressing rollers 24 and 28 the two paper strips 18 are stucked to each other, thus binding between them a piece of the rope portions 16.

SUBSTITUTE SHEET

- 8 -

The assembly formed by strips 18 and portions 16 now forming a whole, is fed into the apparatus according to the arrow G of fig.1.

5 The rope handles are now formed by means of two cutting operations, lengthwise and crosswise respectively as hereinafter explained.

The first cut to be carried out is the lengthwise one and, to such aim, a circular rotating blade 30 is used.

10 The crosswise cut is carried out thereafter and, to such aim, a plane blade 32 is used rotating on a median axis substantially horizontal and provided, on its opposite sides, with two cutting edges having length essentially equal to a half of its
15 total length, said edges being provided on both sides of the median line along which the lengthwise cut has been carried out.

The obtained rope handles designated 34, are now fed to the station for carrying and feeding them
20 to the bag forming station.

As it is noted referring again to fig.1, said station for carrying and feeding rope handles 34, for the sake of brevity hereinafter simply defined handles, consists of two substantially identical parts, designated 12a and 12b, symmetrically arranged with respect
25 to the feed direction of handles 34. Clearly only one of said two parts is described and in particular the part 12b will be described as, on the side of its location, a station controlling means is arranged
30 that will be also described.

Referring now also to figs.2 to 8 at first

SUBSTITUTE SHEET

- 9 -

figs.2 to 5 will be considered showing means by virtue of which the handles 34, one at a time, are gripped and held by means carrying them until the entrance of the bag forming station.

5 In the part 12b a plurality of pliers 36 is provided for carrying handles 34 which are supported in any known way by a chain 38 visible in figg. 2 to 8 and represented by the dash-and-dot line in fig.1 having a substantially rectangular development with
10 a side arranged in front of the entrance of the bag forming station.

Each of the carrying pliers 36 essentially consists of a lower jaw 40 pivoted through a pin 42 on an element on which there is also pivoted, again
15 through pin 42, an upper jaw 44, which is separated by the lower jaw 40 thanks to the hereinafter described means that allows the shutting of plier 36 when the latter moves away from this means.

The upper jaw 44 is upperly provided with a
20 roller 46 rotatably supported by a pin 48 integral with the upper side of the upper jaw 44.

The means controlling the opening and allowing plier 36 to close is arranged in the zone indicated by section C in fig.1 and is shown in detail in
25 figs. 2 to 5.

Said means essentially consists of a cam shaped section 50 integral with the apparatus casing and arranged at a higher position than the feeding path of pliers 36 at the arrival zone of handles 34 which,
30 in fig.2, are fed in the direction of the arrow H.

SUBSTITUTE SHEET

- 10 -

As there is seen in particular in fig.2, cam section 50 has a first inclined plane side 52 which extends in a second side substantially parallel to the feeding direction of pliers 36. The roller 46 of plier 36 successively engages with both sides 52,54 of cam section 50 and in particular the engaging of roller 46 with inclined plane side 52 of cam 50 drives the opening of plier 36 as there is seen in particular in figs. 3 and 4. While jaw 44 rotates upward, jaw 40 is held by a clamp 51 allowing the opening of the plier which is kept opened as long as roller 46 is engaged with side 54 until, as it is noted in particular from fig.2, said roller 46 engages with the terminal part 56, substantially bent of a right angle, of cam section 50. In this condition plier 36, although staying opened, is rotated of 90° just by virtue of the 90° bending of chain 38 which advances in the direction of the arrow L of fig.2 and in this condition plier 36 receives a handle 34.

From this condition, once both branches of handle 34 are placed between jaws 40 and 44 of plier 36, the latter leaves cam section 50 and, thanks to the action of a non represented spring arranged on pin 42, e.g. a helical spring, plier 36 is closed as shown in fig.5 holding handle 34, e.g. as shown in fig.2 for plier 36 in the upper part of this drawing.

As handles 34 are fed one at a time to the part 12b of the apparatus and pliers 36 advance in synchronism with such feeding, the pliers will keep a handle 34 at a time carrying it towards the successive stations of the apparatus.

SUBSTITUTE SHEET

- 11 -

The operating step immediately following the keeping of a handle 34 consists in the smearing of a layer of adhesive material on the lower side of sheets 58 holding the ends of the U-bent rope of a handle 34. This step is visible in particular in fig.1 wherein there is seen that, underneath the feeding path of sheets 58, a roller 60 is arranged, rotatably supported in any known way by the apparatus casing, which lowerly engages with the second roller 62 rotatably supported in any not represented known way by the apparatus casing. It is partially dipped into a tray 64 containing the adhesive material. This is transferred from the second roller 62 to the first roller 60 which smears said material on the lower side of sheets 58.

The pliers 36, and the handles 34 therewith, continue in advancing towards the bag forming station until they are further rotated of 90° so that sheets 58 are placed in front of the entrance of the bag forming station. This further rotation is obtained thanks again to the change of direction, substantially of 90° , of chain 38.

The successive operating steps of taking handles 34 from pliers 36 and their application on the paper strip from which bags will be obtained take place while pliers 36 advance along the rectilinear path parallel to the entrance side of the bag forming station.

Now reference will be made particularly to figs. 6 to 8 to describe the means which accomplishes the opening of pliers 36 and the carrying of handles

SUBSTITUTE SHEET

- 12 -

34, one in the part 12b and one in the part 12a, to the bag forming station and their application on the strip from which bags are obtained.

5 The means which opens pliers 36 is located, in fig.1, in the positions indicated by the sections B, while the means which carries handles 34 to the bag forming station is visible in fig.1 and the relative means for its operation is located, in fig.1, in the position indicated by section A.

10 It must be appreciated that in figs. 6 to 8 either the means located in the section A has been represented or the one of section B in fig.1 but their actual position will be clear from the function they perform with relation to pliers 36 or handles
15 34.

In this part of the apparatus two main driving shafts 66 and 68 are provided extending parallel to each other as well as parallel to the advancing direction of pliers 36 along the path during which
20 the opening of pliers 36 and the taking of handles 34 take place. In fig.1, for the sake of illustrative clearness, only the driving shaft 66 has been represented and in said drawing there is seen that it extends, like the shaft 68 although not represented, for all
25 the apparatus length.

Now there will be described at first the driving means located in the position indicated by section A in fig.1.

Said means comprises a rotatable driving cam
30 70 having two curvilinear protruding portions substantially diametrically opposed, which is keyed on a

SUBSTITUTE SHEET

- 13 -

rotating shaft 72 on the apparatus casing and connected to a not represented driving motor.

The cam 70 engages with an idle roller 74 rotating on a supporting pin 76 which is fixed, at one end thereof, in correspondence with the vertex of a first lever 78 having a substantially triangular shape, another vertex of which is fixed on the driving shaft 68.

On the remaining vertex of the first lever 78 a pin 80 is fixed on which the end is pivoted of a connecting rod 82 whose other end is pivoted on a pin 84 fixed on one end of a second lever 86 whose other end is keyed on the shaft 66.

Now the means will be described located in the position indicated by section B' of fig.1 as well as the one intended to take handle 34 from plier 36 and to feed it to the forming station of bags which are shown in fig.1.

The means located in the position indicated by section B in fig.1 is intended to control the opening of plier 36 while this advances leftwards in fig.1 for the part 12b and it is formed by a sleeve 88 fixed on the shaft 68 so as to rotate therewith. The sleeve 88 is nevertheless connected to the shaft 68 by non represented known means which allows its motion on said shaft depending on the position in which handle 34 will have to be applied. In other words the motion of sleeve 88, which will have to take place at the same time and with the same extent of means for taking handle 34, implies an advanced or delayed opening of pliers 36.

SUBSTITUTE SHEET

- 14 -

The sleeve 88 is provided with a recess to which a small arm 92 is applied, by means of a screw 90, suitable to engage with roller 46 of plier 36.

5 The means accomplishing the taking of handle 34 and the feeding thereof to the bag forming station comprises a sleeve 94 fixed on the shaft 66 which is provided with a recess in which, by means of screws 96, a pair of small arms 98 is fixed extending downwards to the plier 36 and substantially parallel to
10 each other. Also sleeve 94, as already said for sleeve 88, is connected to shaft 66 so that it may be moved thereon and kept in different positions for the hereinabove described reasons as it will be explained in the following.

15 A possible arrangement to obtain the movement of sleeves 88 and 94 on the shafts 68 and 66 schematically represented in figs. 6 to 8 and essentially consists of a plate 100 supported by a threaded shaft 102, rotatably substaigned at its ends by the apparatus
20 casing, which screws itself into a threaded hole of plate 100 so that the revolutions of said threaded shaft 102 are transformed in transverse shiftings of plate 100.

In figs. 6 to 8 in particular there is seen
25 that each of the small arms 98 is provided, at its lower end, with a shaped appendix 104 having a notch 106 with a shape, in transverse section, essentially triangular whose mouth is directed towards sheets 58 of handles 34.

30 The paper bag forming station is known thus it is not represented. Only the paper strip 108 thereof

SUBSTITUTE SHEET

- 15 -

is shown from which bags will be obtained, that winds itself round a return roller 110 with which a pressing roller 112 cooperates, the strip 108 sliding through two said rollers.

5 The roller 112, cooperating with roller 110 exerts on the strip 108 the necessary pressure to accomplish a perfect adherence of sheets 58 on strip 108 and therefore a firm application of handles 34.

10 In fig.9 there is illustrated a different realization of means supporting and carrying handles 34 and, according to such a realization, they consist of a sucker 114 supported by a casing 116 pivoted at 118 on a body 121 integral with chain 38.

15 The sucker 114 is connected through a flexible pipe 120 to a non represented air suction station suitable to keep constant the drop of pressure inside sucker 114 when required.

20 The means for taking handles 34 and carrying them from sucker 114 to the bag forming station is substantially identical to the one of the previous realization.

25 As there is seen from fig.9 also in this case a pair of small arms 122 is provided extending upwards and fixed, with their lower end, to a sleeve 135 movably mounted on a shaft 134 rotatable on the apparatus casing. On shaft 134 the end of a lever 124 is fixed which is actuated by a rotatable cam 126. The cam 126 is keyed on a shaft 128 supported in any not represented known way by the apparatus casing,
30 and connected to a control motor.

On one end of the oscillating lever 124 a pin

SUBSTITUTE SHEET

- 16 -

130 is applied on which a roller 132 is rotatably arranged which engages with cam 126.

Also in this case on the end of each of the small arms 122 a shaped appendix is provided having a notch 138 intended to engage with sheets 58 of handles 34.

Also in fig.9 the same elements of the paper bag forming station are shown as in figs. 6 to 8.

Now the operation of the apparatus according to the present invention will be described particularly relating to the operating steps of opening pliers 36 and feeding handles 34 to the bag forming station, as the taking of handles 34 by pliers 36 has been already hereinabove described referring in particular to figs. 2 to 5. The same should be considered for the operating step of applying glue on sheets 58 of handles 34 as also this step has been previously described referring to fig.1. Thus now there will be considered in particular figs. 6 to 8 being the most significant about this matter.

There is assumed to start from the condition in fig.6 which may be considered the normal position for the driving parts, in which cam 70, although in contact with roller 74, does not exert any pushing action thereon to cause the motion of the above described kinematic mechanism.

The cam 70, which is always rotating being connected to the apparatus driving means through shaft 72, moves from the position in fig.6 to that in fig.7, causing the engaging of its portion having greater bending radius with roller 74 and thus it

SUBSTITUTE SHEET

- 17 -

will exert a pushing action on the latter causing an anti-clockwise rotation of the first lever 78, this rotation being allowed thanks to shaft 68 which is freely rotating on the apparatus casing.

5 While cam 70 proceeds with its rotation the mechanism reaches the condition represented in fig.7 in which small arm 92 of sleeve 88 has driven a complete rotation of the whole plier 36 around pin 42. The plier 36 is held in this close condition by
10 means of the above mentioned non represented helical spring wound on pin 42.

 In fig.7 there is seen that this initial rotation of plier 36 caused a corresponding rotation of handles 34 whose sheets 58 moved in correspondence
15 of notch 106 of appendix 104 of small arms 98.

 The rotation of cam 70 continues until this engages its portion having greater bending radius with roller 74 and this further rotation brings the mechanism in the condition shown in fig.8.

20 In said figure there is seen that first lever 78 rotated further and its small arm 92 drove the opening of plier 36 with raising of upper jaw 44. The lower jaw 40 stayed in the position of fig.7, i.e. it rotated no more just to allow the opening of plier
25 36. This stopping of lower jaw 40 may be accomplished in any known way, e.g. by providing a catch on the support of jaws 40, 44 which prevents a further rotation of jaw 40.

 The further rotation of first lever 78 caused
30 also a further rotation of connecting rod 82 implying in turn a clockwise rotation of second lever 86

SUBSTITUTE SHEET

- 18 -

allowed by the free rotation of shaft 66 on the apparatus casing.

The rotation of second lever 86 implies the consequent rotation of small arms 98 so that their lower end, namely their appendix 104, engages with sheets 58 of handle 34 whose rear edge fits into notch 106 of appendix 104. Small arms 98 exert a forward pushing action on handles 34 so that, as shown in fig.8, their front edge slides between rollers 110 and 112 above paper strip 108. As the lower surface of sheets 58 is smeared with glue, the passage of said sheets between said rollers 110, 112 will automatically imply their glueing on strip 108.

After these operating steps cam 70 engages again with roller 74 with its portion having smaller bending radius so that the whole mechanism will gradually return in the position shown in fig.6. The operating cycle herein described repeats every time a plier 36, either in the part 12b or in the part 12a of the apparatus, positions itself in front of small arm 92 of sleeve 88 and in front of appendixes 104 of small arms 98.

In fig.1 in particular two handles 34 have been shown applied on strip 108 intended to form respectively the left and right handle of a bag.

The above described operation with reference to pliers 36 should be considered substantially valid for the different realization in which suckers are employed. In this case the opening of pliers 36 to allow the taking of handles 34 is substituted by the interruption of air-suction in suckers 114 so that

SUBSTITUTE SHEET

- 19 -

5 sheets 58 of handles 34 can move downwards and fit their rear edge in notch 138 of small arms 122. These will be later operated by cam 126 and caused to rotate until the position represented in broken line in which the front edge of sheets 58 begins to slide between rollers 110 and 112 for their glueing on strip 108 as previously described.

10 For this different realization it will not be necessary the arrangement of cam section 50 as in figs. 2 to 5 as pliers 36 are not employed and therefore their opening is not necessary. The several suckers 114, from time to time, will exert a sucking action on sheets 58 of handles 34 substantially in correspondence with the position in which the cam
15 section 50 is arranged according to the first realization.

From the above the advantages of the apparatus according to the present invention are clear and the most important of them are summarized hereinafter.

20 Building simplicity and extremely reduced encumbrance of the apparatus as all the different operating stations are arranged in line and substantially all at the same height, for instance at man's height.

25 Easiness and readiness of the apparatus adjustment as when the distance between the application zones of handles 34 has to be changed just the moving of two sleeves is sufficient, namely sleeves 88 and 94, naturally either for part 12b or for part 12a,
30 and this is easily accomplished by rotating the threaded shaft 102 which drives the corresponding

SUBSTITUTE SHEET

- 20 -

movements of the two plates 100.

When instead the applying frequency of handles 34 on strip 108 has to be changed it will be sufficient to change the speed of chains 38 carrying
5 pliers 36 or suckers 114 and also this adjustment is accomplished contemporaneously with the changing of the cutting pitch of bags in the forming station thereof.

Building simplicity of mechanisms intended to
10 move handles 34 and this clearly implies a considerable reduction of the apparatus maintenance with respect to that necessary for the usual machines.

Finally it is clear that variations and/or
modifications may be brought to the apparatus according to the present invention, without thereby exceeding the scope of protection of the invention itself.
15

- 21 -

CLAIMS

1. Apparatus for carrying rope handles for paper bags to a forming station thereof wherein said handles are applied on a paper strip at the entrance
5 of said station before forming the bags, characterized in that it comprises a first and a second plurality of means (36,114) for gripping the handles (34) arranged substantially side by side and laterally with respect to the feeding direction of two rows of
10 handles (34) fed from a forming station (10) thereof, said gripping means (36,114) being carried by supporting means (38) moving along an essentially close path which is rectilinear at least along a first tract adjacent to that in which the handles (34)
15 supported by said gripping means (36,114) are feeded towards the bag forming station entrance and along a second tract in which said handles (34) move transversally with respect to the direction along which they are introduced in the bag forming station, in a
20 substantially median zone of said first tract there being provided means (60,62,64) to smear a glue layer on a surface of sheets (58) holding the ends of the U bent rope of the handle (34), along the second tract there being provided means to inhibit said means
25 (36,114) for gripping the handles (34) and means to bring the handles to the bag forming station.

2. Apparatus according to claim 1, characterized in that said gripping means is pliers (36) carried by a transporting chain (38) moving along an essentially
30 ly rectangular path.

3. An apparatus according to claim 2, charac-

terized in that said pliers (36) comprise an upper jaw (44) and a lower one (40) kept in closed position by elastic means arranged on the mutual pivoting pin of the two jaws (40,44).

5 4. An apparatus according to the claims 1 and 3, characterized by the fact that, in the zone in which the handles (34) reach the pliers (36) a cam section (50) is provided driving the opening of a plier (36) at a time to allow the fitting therein of
10 a handle (34).

 5. An apparatus according to claim 4, characterized by the fact that said cam section (50) engages with the pin (46) of the upper jaw (44) at first with a side inclined with respect to the movement direction
15 of the plier (36) and successively with a side parallel to said direction, there being further provided stop means (51) suitable to prevent rotations of the lower jaw (40) during the whole time of opening of the plier (36).

20 6. An apparatus according to claims 1, 2 and 3, characterized by the fact that in the second tract along which the pliers (36) of each pliers plurality move, a movable small arm (92) is provided suitable to engage with the pin (46) of the plier (36) to
25 drive at first a rotation of said plier kept closed by the elastic means combined therewith and successively a rotation of only the upper jaw (44) of the plier (36) while the lower jaw (40) is blocked by stop means to obtain the opening of the plier (36).

30 7. An apparatus according to claim 6, characterized by the fact that said small arm (92) is support-

- 23 -

ted by a sleeve (88) which may be blocked in an adjustable position on a shaft (68) rotatable on the apparatus casing.

8. An apparatus according to claim 7, characterized by the fact that the rotations of the shaft (68) are driven by cam means (70) operating on said shaft (68) by a driving lever (78) having an end keyed on said shaft (68).

9. An apparatus according to claim 1, characterized by the fact that in the second tract along which the pliers (36) of each plier plurality move, a means is provided for taking the handle (34) from the plier (36) when this is opened and for feeding the handle to the bag forming station.

10. An apparatus according to claim 9, characterized by the fact that said means for taking and feeding a handle (34) to the bag forming station comprises a pair of small arms (98) fixed on the upper end of a sleeve (94) which may be blocked in an adjustable position on a shaft (66) rotatable on the apparatus casing, and provided at their lower end with a shaped appendix (104) having a notch (106) whose mouth is directed towards the bag forming station and suitable to engage with the rear edge of the sheets (58) of the handle (34).

11. An apparatus according to claim 10, characterized by the fact that the rotations of the shaft (66) are driven by a lever (86) having an end keyed on said shaft (66) and the other end connected to the driving lever (78) through a rod (82) hinged at its ends through said driving levers (86,78).

SUBSTITUTE SHEET

- 24 -

12. An apparatus according to claim 1, characterized by the fact that the means to smear a glue layer on the sheets (58) of the handle (34) is arranged below the plan along which the handles (34) are
5 feeded toward the bag forming station.

13. An apparatus according to claim 1, characterized by the fact that said means for taking the handles (34) are suckers (114) that are started in the zone wherein they receive the formed handles
10 (34).

14. An apparatus according to claims 1 and 13, characterized by the fact that said suckers (114) are inhibited while they are moving transversally with respect to the direction of feeding of the
15 handles (34) to the bag forming station while simultaneously a means is operated to bring said handles to said station.

15. An apparatus according to claim 14, characterized by the fact that said means bringing the
20 handles (34) to the bag forming station comprises a pair of small arms (122) fixed on the lower end of a sleeve (135) that may be blocked in an adjustable position on a shaft (134) rotatable on the apparatus casing.

25 16. An apparatus according to claim 15, characterized by the fact that the rotations of shaft (134) are driven by cam means (126) operating on said shaft (134) through a driving lever (124).

30 17. An apparatus according to claim 15, characterized by the fact that said small arms (122) are provided, at their upper end, with a shaped appendix

SUBSTITUTE SHEET

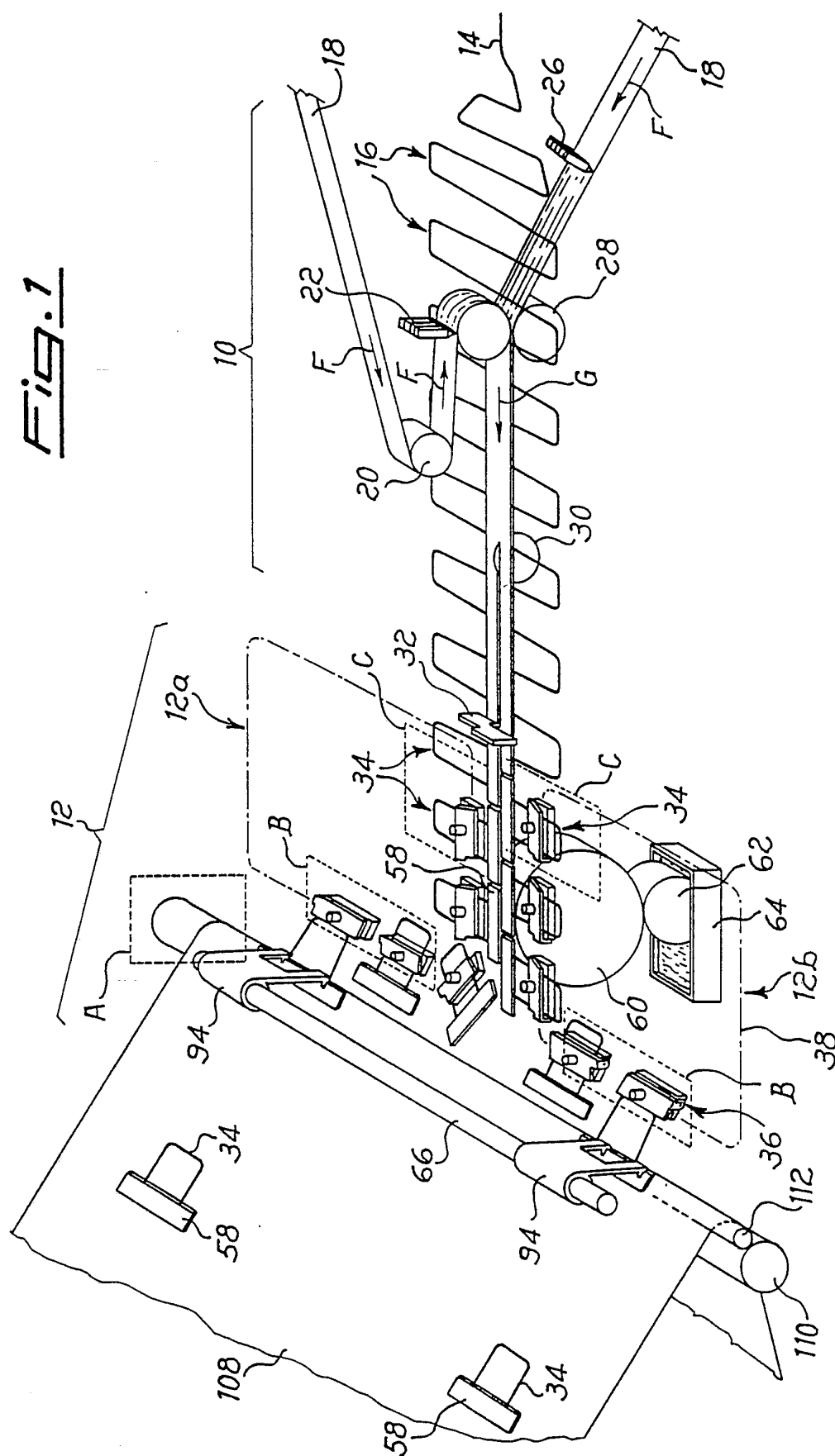
- 25 -

(136) having a notch (138) opened in direction of the bag forming station and suitable to engage with the rear edge of the sheets (58) of the handle (34).

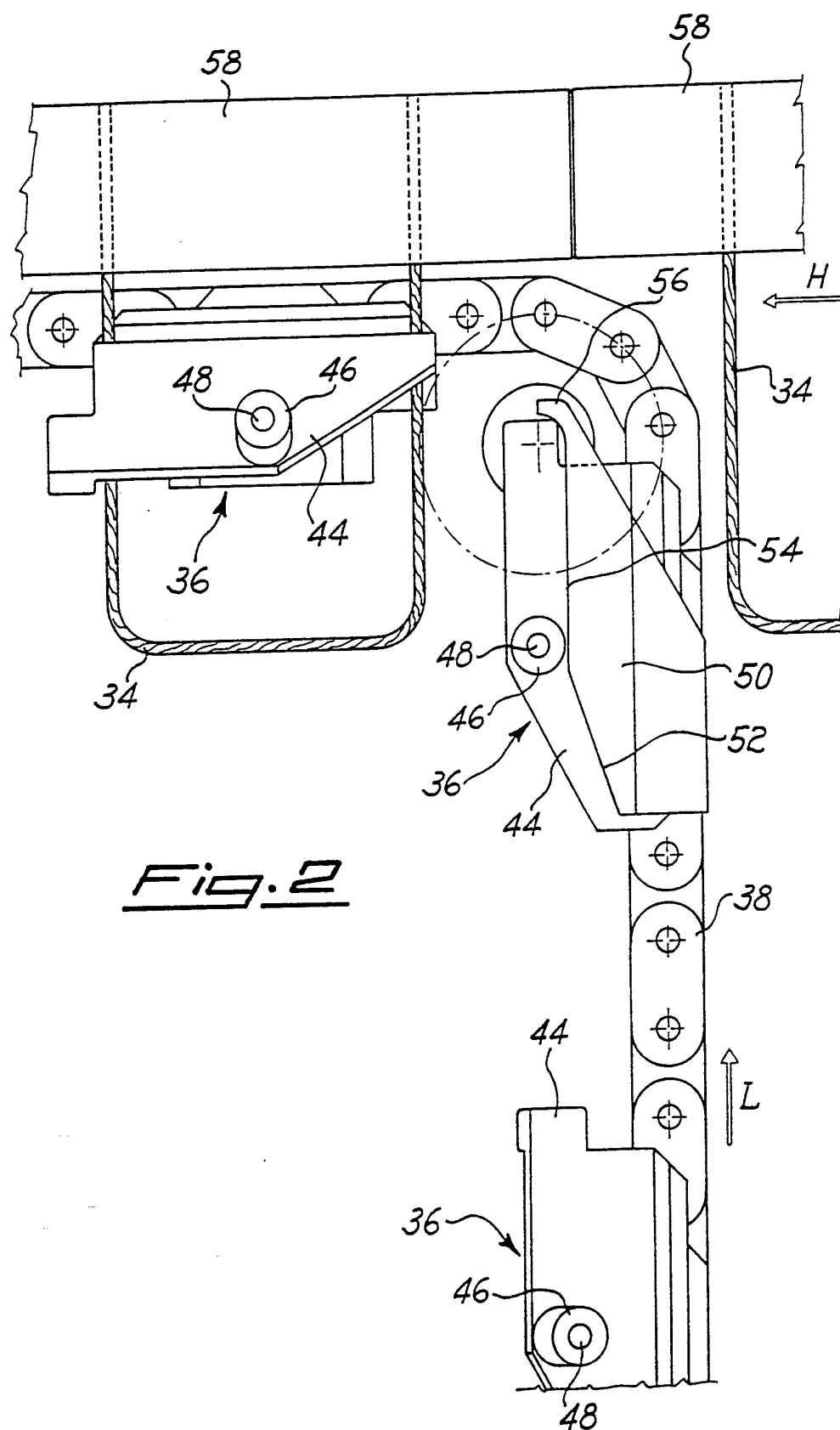
18. An apparatus for carrying rope handles
5 for paper bags to a forming station thereof, substantially as above described and represented in the attached drawings.

SUBSTITUTE SHEET

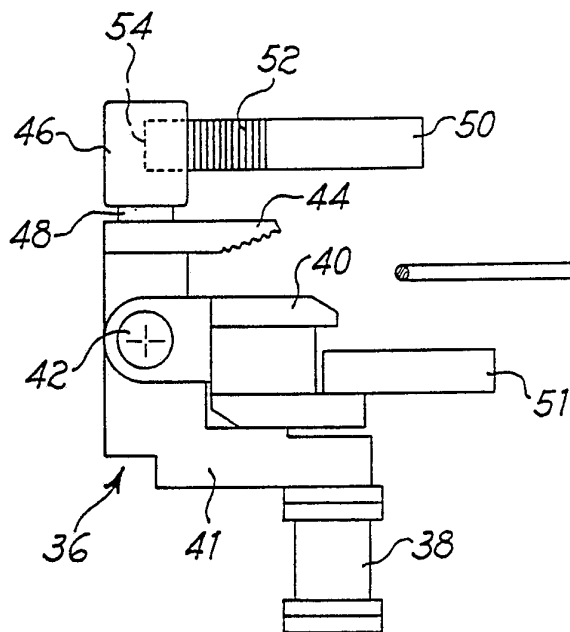
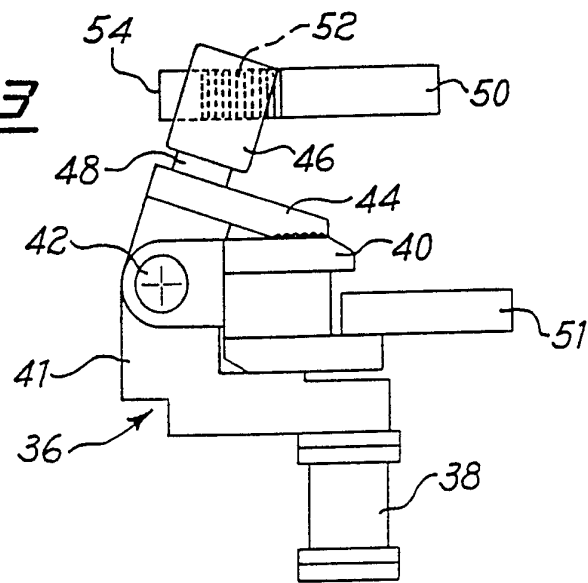
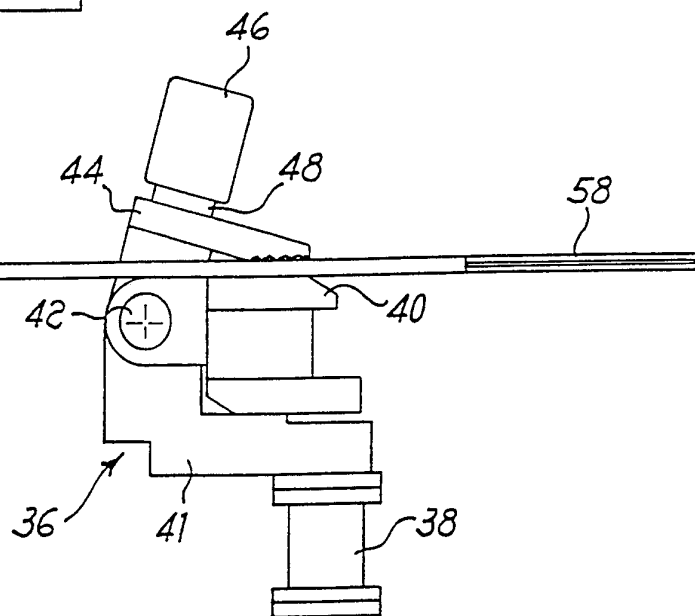
1/7

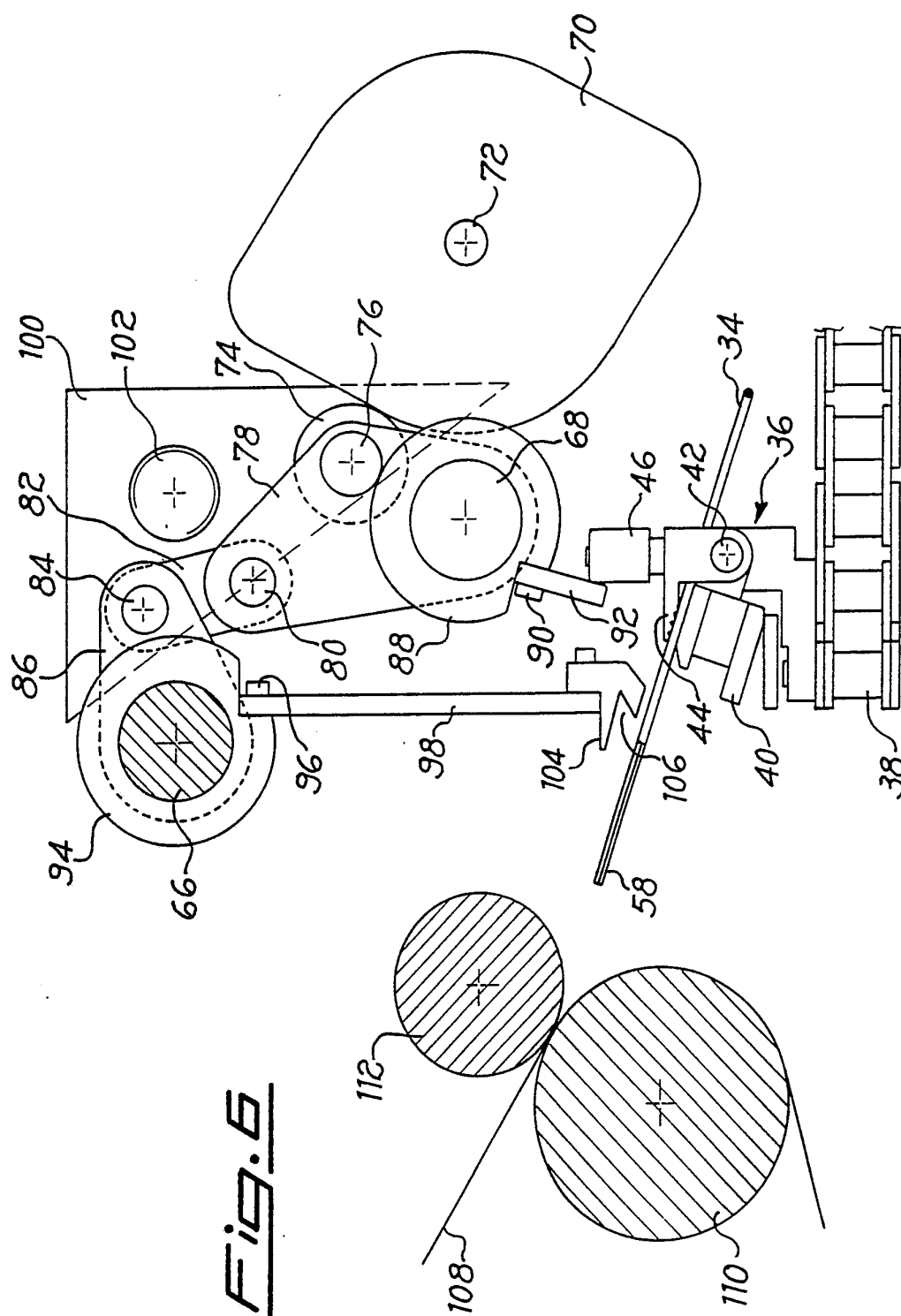
Fig. 1

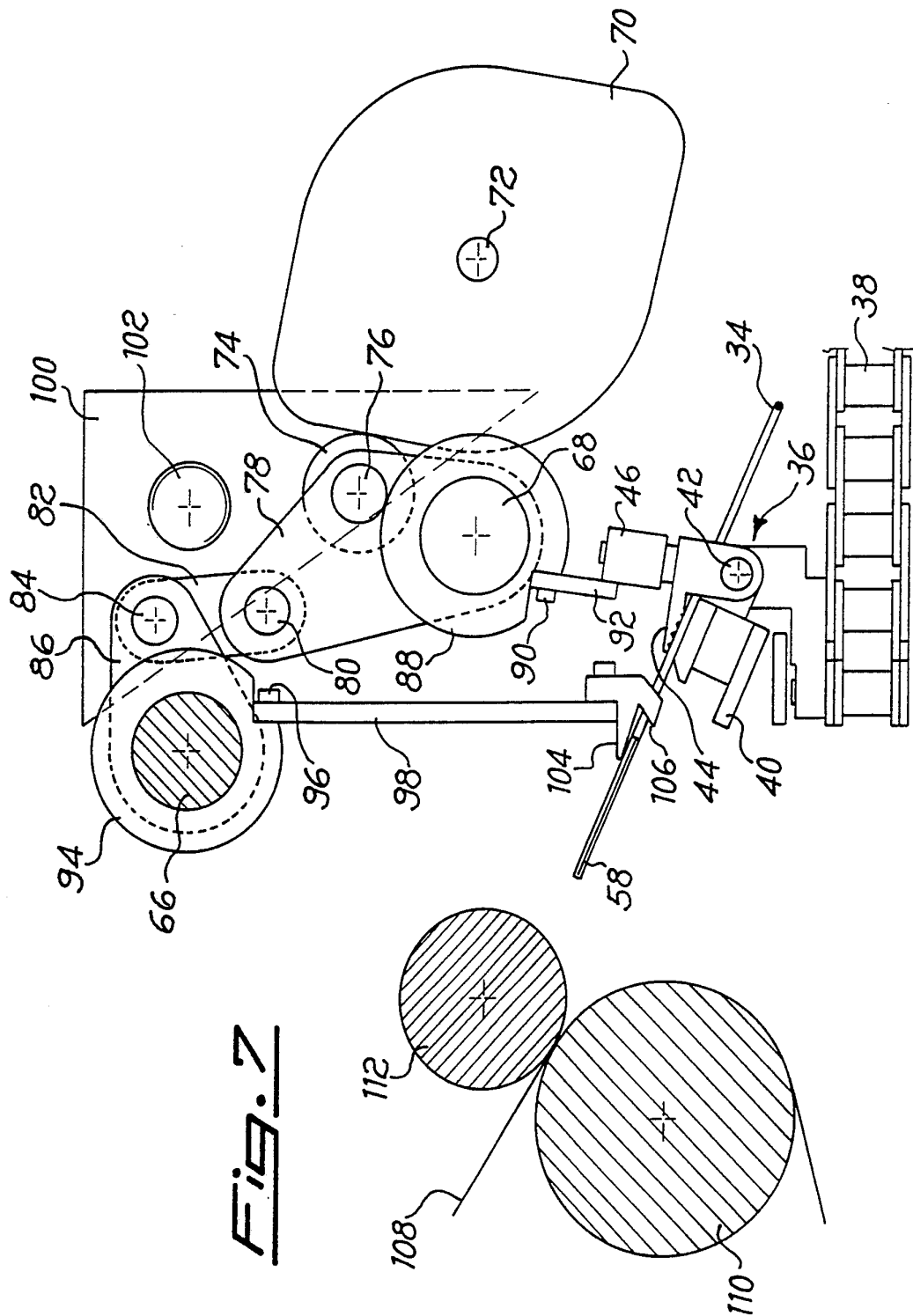
2/7



3/7

Fig. 3***Fig. 4******Fig. 5***





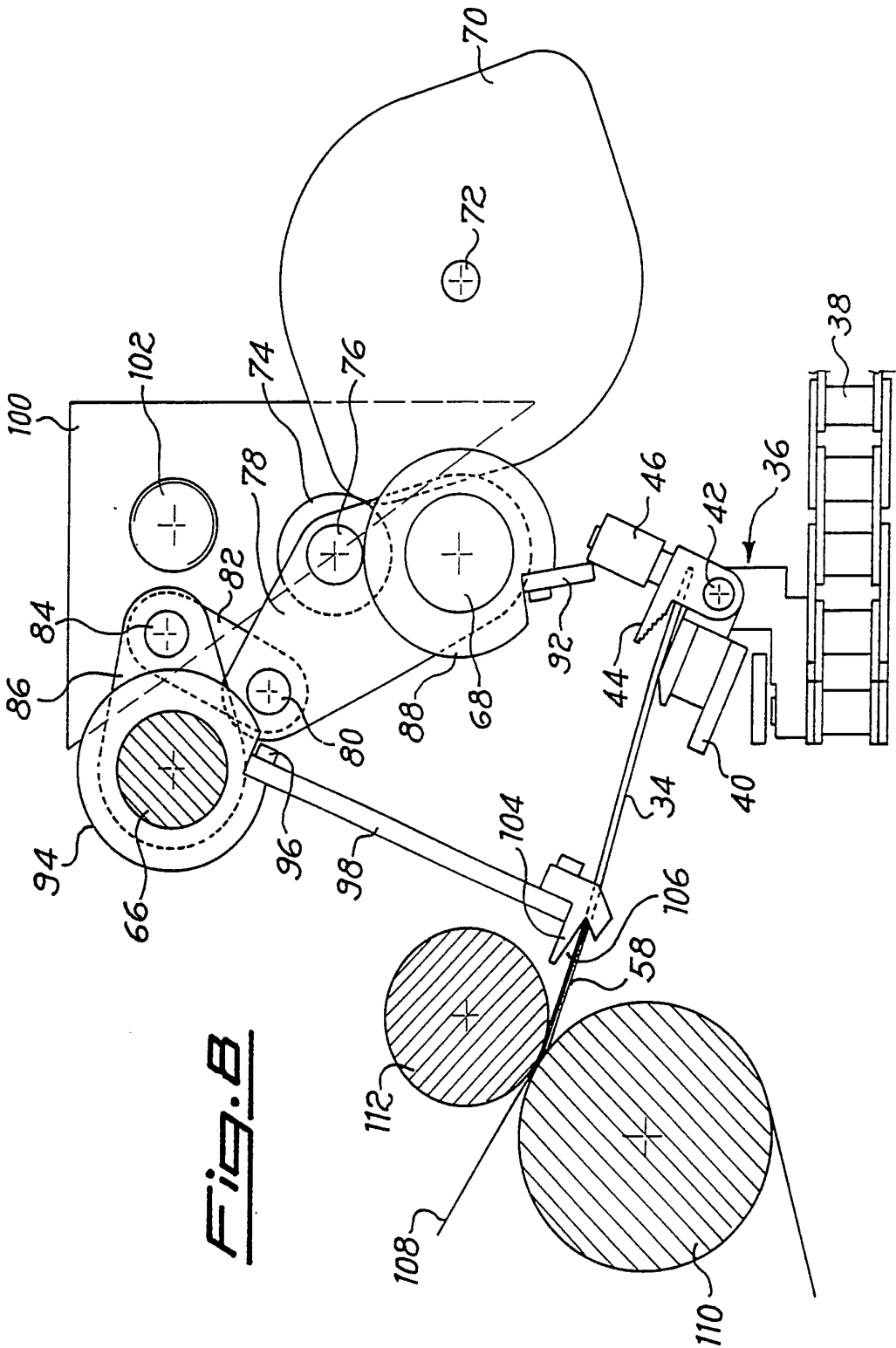
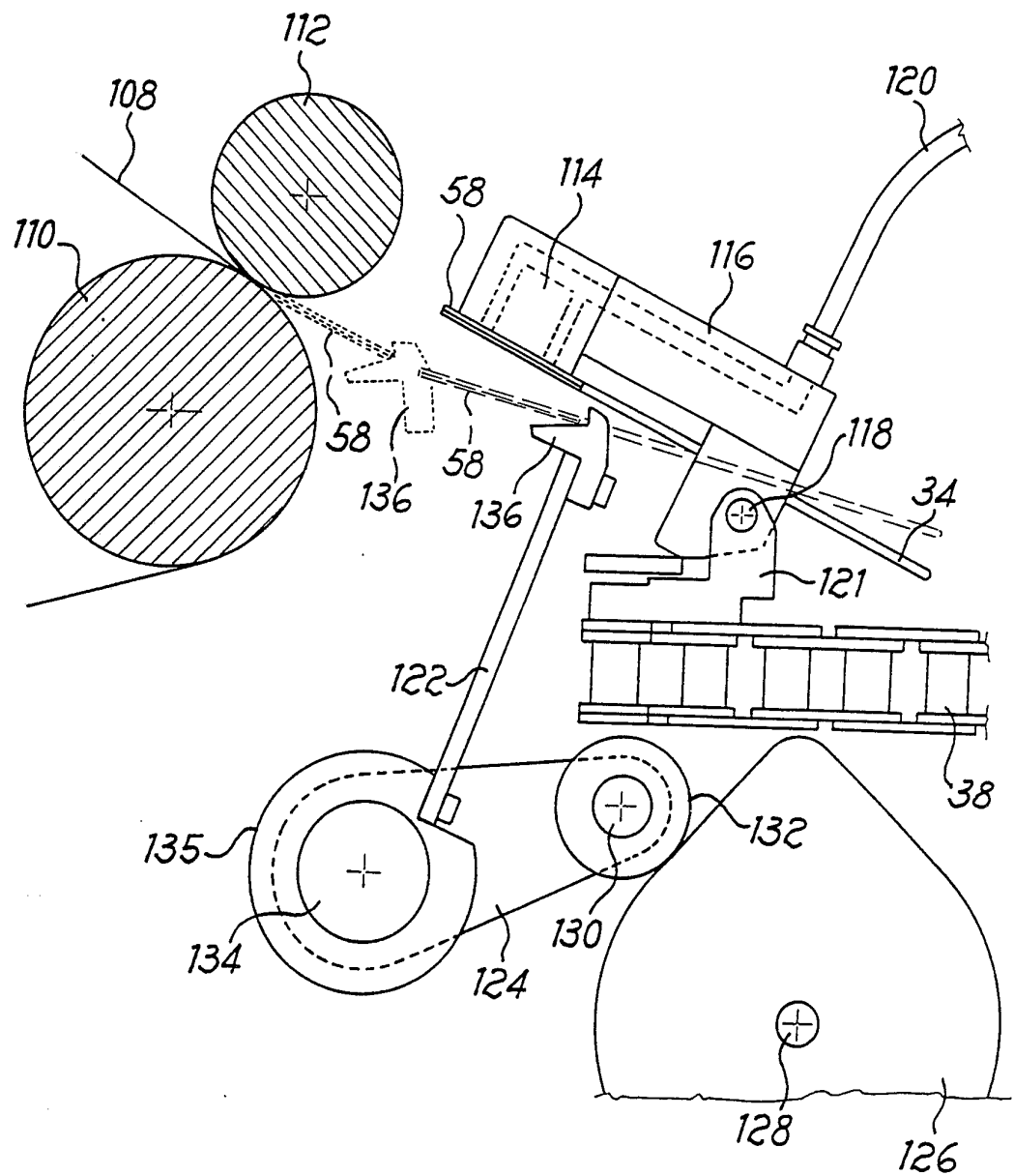


Fig. 9

INTERNATIONAL SEARCH REPORT

PCT/IT 91/00107

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 B31B19/86		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	B31B	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	FR,A,2 096 103 (WINDMOELLER) 11 February 1972 ----	1
A	DE,A,1 611 654 (FISCHER) 14 January 1971 ----	
A	US,A,3 481 256 (HAYES) 1 December 1969 ----	
A	GB,A,881 426 (EQUITABLE) 1 November 1961 ----	
A	GB,A,1 141 744 (HOLWEG) 19 January 1969 ----	
<p>¹⁰ Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
08 APRIL 1992	28. 04. 92	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	PEETERS S.	

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. IT 9100107
SA 55242**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information. 08/04/92

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-2096103	11-02-72	DE-A- 2031305 GB-A- 1340963 US-A- 3810811	30-12-71 19-12-73 14-05-74
DE-A-1611654	14-01-71	None	
US-A-3481256	02-12-69	None	
GB-A-881426		None	
GB-A-1141744		None	