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(54) Procedure and apparatus for wrapping goods.

(57) The invention concerns a procedure for wrapping goods, the end of the wrapper being transferred from a storage roll past the front of the goods to a receiver roll and wound thereupon, the goods and, on the other hand, the storage roll and the receiver roll being moved relative to each other, discharging wrapper material from the storage roll and from the receiver roll, and finally the wrapper being cut off and seamed.

The invention further concerns apparatus for wrapping goods with the aid of a wrapping machine (1) comprising a substantially upright wrapper storage roll (4) and a wrapper receiver roll (5) with grabber (6) and operating means, a transport means (9) for moving relative to each other, on one hand, the goods and, on the other hand, the storage roll and the receiver roll, discharging wrapper material to encircle the goods, and a cut-off and seaming device (10) for cutting off and seaming the wrapper.

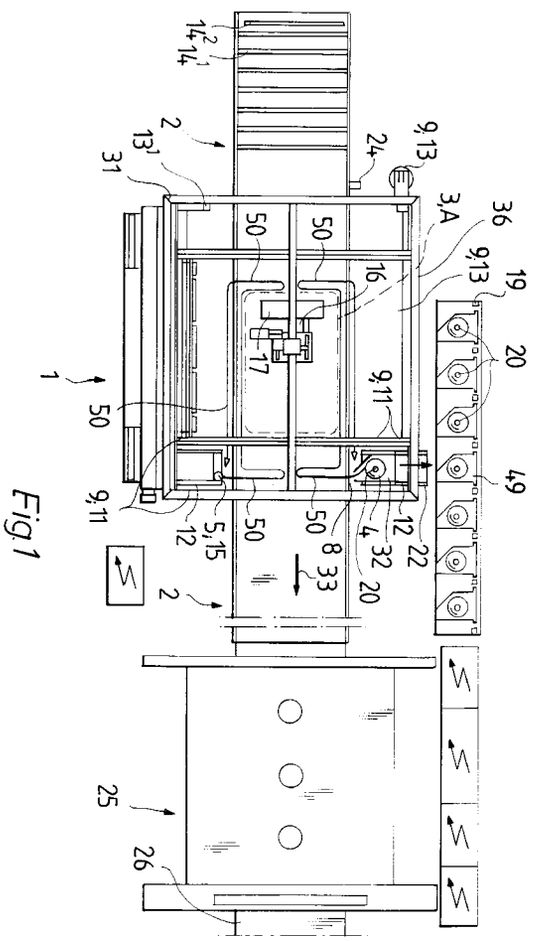

Fig.1

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The present invention concerns a procedure for wrapping goods on a wrapping machine, the goods being transported to the wrapping station of the wrapping machine, the wrapper being wound horizontally around the goods, and the wrapper being cut off and seamed.

The invention further concerns apparatus for wrapping goods horizontally in a wrapper, said apparatus comprising a wrapping machine and a transport means for transporting the goods to the wrapping station.

Various procedures and apparatus for wrapping goods on a wrapping machine are known in prior art, reference being made to the patents FI-80418, FI-81539, FI-83193, DE-2,328,711 and US-4,299,076.

In the Finnish patents cited above, a wrapping machine is disclosed in which the product, or goods, conveyed to the wrapping station is wrapped in a wrapper by revolving a wrapper roll around the goods; after the wrapping step the wrapper is cut off and seamed.

In prior art are furthermore known such wrapping procedures and apparatus in which the wrapper roll is kept stationary and the goods to be wrapped is rotated, thereby winding wrapper upon the goods; in the end the wrapper is cut off and seamed.

The wrapping methods, and apparatus, just mentioned are appropriate to be used in packaging goods, in particular when it is meant to wrap a plurality of layers on the goods. However, wrapping methods and apparatus of prior art are not well-suited to be used in wrapping products on which one single layer of the wrapper should be wound. In such instances, frequently, the wrapping has to be done manually, and this is highly labour-intensive, and expensive.

Furthermore, wrapping methods and apparatus of prior art are mostly unfit for using different wrapper materials, e.g. paper, plastic, corrugated cardboard, etc.

The object of the present invention is to eliminate the drawbacks just mentioned. It is particularly an object of the invention, to provide a novel wrapping procedure and apparatus which are suitable to be used in wrapping goods when substantially one single layer of the wrapper is wound on the goods.

It is a further object of the invention, to provide a novel wrapping procedure and apparatus suitable for use in wrapping various different wrapping materials.

Regarding the features characterizing the invention, reference is made to the claims section.

The wrapping procedure of the invention is based on an operation in which the end of the wrapper is moved, from a substantially upright storage roll, past the goods, e.g. passing it in front of the goods, to the side beyond the goods and upon a receiver roll, at the same time unwinding wrapper material from the storage roll and winding it upon the receiver roll. Next, the goods on one hand and the storage roll on the other hand are moved relative to each other, at the same time unwinding wrapper material from the storage roll and from the receiver roll in such manner that the goods passes the storage roll and the receiver roll, moving through between them, and at the same time the wrapper covers the sides of the goods. Finally, the storage roll and the receiver roll are moved towards each other over the last side of the goods, e.g. passing behind the goods, at the same time unwinding wrapper material from the storage roll and/or from the receiver roll; and the wrapper is cut off and seamed.

Thus, the wrapping takes place accurately and in a programmed manner, one layer of the wrapper is wound around the goods. Any kind of wrapping material known in itself in the art can be used for wrapper, e.g. plastic film, paper, corrugated cardboard, any material compounded of these, and in general any kind of web-like, reelable wrapping material.

In the procedure, the length, and advantageously the width, of the goods can be measured prior to wrapping it. It is then possible to feed onto the receiver roll exactly the amount of wrapper consistent with the measurement made of the goods and absolutely needed to cover the goods.

In connection with the wrapping operation the storage roll and/or the receiver roll may be moved towards each other in front of the goods, in order to carry the end of the wrapper from the storage roll to the receiver roll. In this step the storage roll may be kept stationary, in which case the receiver roll is moved towards the storage roll and again away therefrom; similarly, the receiver roll may be kept stationary, in which case the storage roll is moved towards the receiver roll and again away therefrom. In the most advantageous embodiment of the invention the storage roll and the receiver roll are both moved towards each other in order to transfer the wrapper end to the receiver roll.

During the wrapping operation the goods may be moved relative to the storage roll and the receiver roll past them; in the most advantageous embodiment the goods that is being wrapped is however kept stationary in the wrapping station and the storage roll and receiver roll are moved past the sides of the goods and, finally, towards each other in order to accomplish the seaming. It is then possible to position the seam, advantageously, somewhere about the centre of the side of the goods.

When the goods has been wrapped, the marginal parts of the wrapper projecting over its top, if any, may be folded down against the top face of the goods with the aid of moving, and possibly heatable, folding members.

The apparatus of the invention for wrapping goods comprises a particular wrapping machine and a transport means for transporting the goods to the wrapping station of said wrapping machine. The wrapping machine comprises two substantially upright

rolls, a wrapper storage roll and a wrapper receiver roll with grabber and operating means for grasping the end of the wrapper fed from the storage roll and for winding wrapper material around the receiver roll.

For the purpose of moving the storage roll and receiver roll relative to each other, one of them, any one of the two, may be stationary relative to the other, the other being movable. In the most advantageous embodiment the storage roll and the receiver roll are both movable relative to each other and they are provided with guidance and moving members, such as guides, a threaded screw, a belt conveyor, a cog belt, or equivalent, and with a power means, such as an electric motor, for moving them towards each other, and away from each other.

For moving the goods on one hand, and the storage roll/receiver roll on the other hand, relative to each other, one of them, any one of the two, may be disposed to be stationary, the other then being disposed to move relative to the first. Thus, for instance, the storage roll/receiver roll may be substantially stationary relative to the goods and/or its base, in which case the goods is disposed to move relative to the storage roll/receiver roll to accomplish the wrapping. In the most advantageous embodiment, however, the goods is disposed to be stationary, and the storage roll and the receiver roll both are movable relative to the goods. In that case the storage roll and the receiver roll are mounted to be carried e.g. on a transport means, such as a transport slide, which is provided with a particular power means for moving the slide, and thereby the storage roll and the receiver roll both at once and simultaneously, relative to the goods.

In an embodiment of the invention the apparatus comprises a particular measuring device for measuring the horizontal dimensions of the goods, and a measuring member for measuring the length of the wrapper that should be wound on the receiver roll to be consistent with the measurement made on the goods, and accounting for the wrapper portion which will come from the storage roll. The measuring device may, for instance, consist of a line of photocells disposed in conjunction with the transport means or on the wrapping station to produce a signal corresponding to the length and/or breadth of the goods that is being wrapped. The measuring device may further consist of a clock means provided e.g. in conjunction with the transport means and/or the wrapping station, measuring the passage time of the goods that is being transported and producing a signal corresponding to the length dimension of the goods. The measuring device may be any kind of measuring means known in itself in the art. The measuring member serving to measure the length of wrapper wound on the receiver roll may, for instance, consist of a member measuring the thickness of the storage roll and/or the receiver roll and/or the length of wrapper to be wound on the roll, of a clock means measuring the wrapping time, of a follower wheel measuring the length of wrapper being wound on the receiver roll, or in general any kind of member measuring the wrapper length. The measuring member is advantageously arranged to discontinue the winding of wrapper on the receiver roll, for instance by stopping the receiver roll drive as soon as a length of wrapper consistent with the goods measurement has been wound on the receiver roll, accounting for the total length of wrapper required and, as a deduction, the wrapper to be wound around the goods which will come from the storage roll.

Furthermore, the apparatus of the invention advantageously comprises a particular folding means with at least one folding member, disposed to fold down against the top face of the goods any marginal portions of the wrapper which project over the top of the goods. There may equally be several folding members, e.g. four of them with one provided opposite each side of a quadrangular piece of goods, above the goods. The folding member may be provided with a heating means, such as an electric resistance, for heating this member and hot seaming the margins of the wrapper against the top face of the goods.

Furthermore, the apparatus of the invention advantageously comprises a storage roll magazine which can hold several storage rolls, either equal in height or of different heights e.g. for wrapping goods of different sizes. In that case the storage roll is advantageously provided with particular transport members for transporting the storage roll into the magazine and taking a new roll into the wrapping machine from the magazine. The storage rolls may for instance be placed each one in a particular housing, i.e., in a cassette, in which case the entire housing or cassette with its roll can be replaced in the wrapping machine.

Furthermore, the apparatus advantageously comprises a particular height measuring member, such as a photocell measuring member or equivalent, disposed to measure the height of the goods; in that case the wrapping machine is advantageously arranged to select the respective cassette and to transport the cassette with its roll from the storage roll magazine into the wrapping machine.

The apparatus of the invention comprises, moreover, a wrapper cut-off means, such as a cut-off means based on shearing, cutting, hot air blowing, tearing, or any action whatsoever known in itself in the art, for instance as disclosed in the references cited in the introduction of this application. Furthermore, the apparatus comprises a particular seaming means, which may be based, for instance, on hot seaming, seaming accomplished with adhesive cement, seaming accomplished with glue in general, stapling or, generally, any kind of seaming whatsoever.

When using the procedure and/or apparatus of the invention, one is enabled to package the goods accurately, and in programmed manner, to be cov-

ered by a single wrapper layer. If desired, the wrapper can be folded and seamed against the top face of the goods to produce a compact and uniform package. Furthermore, the procedure and/or the apparatus is appropriate to be used in connection with plastic wrapping, paper wrapping, cardboard wrapping or any materials compounded of these, or in general in connection with any packaging material whatsoever.

The invention is described in detail in the following with the aid of an advantageous embodiment example, referring to the attached drawings, wherein:-

Fig. 1 presents, in a schematic drawing, an implementation of the procedure and apparatus of the invention on a goods packaging line, viewed from above,

Fig. 2 presents the storage roll cassette and receiver roll of the wrapping machine of Fig. 1 when the web end is being transferred to the receiver roll, viewed from above,

Fig. 3 presents the apparatus of Fig. 2, in the seaming step,

Fig. 4 presents the schematic drawing of a transport means for the storage roll and receiver roll of the apparatus of the invention, and

Fig. 5 presents the schematic drawing depicting a top sheet device in the apparatus of the invention, viewed from above.

In Fig. 1 is depicted an apparatus according to the invention for wrapping products, that is goods, horizontally in a wrapper, and placed in conjunction of a goods packaging line. The apparatus comprises a wrapping machine 1 and a transport means 2 for conveying the goods to the wrapping station 3 (indicated with interrupted lines) of the wrapping machine. The wrapping machine here depicted is meant, in the first place, for wrapping goods in shrink film. The transport means 2 is further disposed to convey the goods that have been wrapped in the wrapping machine, to a heating means 25 for heating the shrink film, and further to a goods line 26.

The wrapping machine 1 comprises a substantially upright wrapper storage roll 4, installed in a cassette 32, a substantially upright wrapper receiver roll 5 with grabber 6 and operating means 7 (Fig. 4) for grasping the end 8 of the wrapper and for winding the wrapper around the receiver roll, a transport means 9 for moving relative to each other, on one hand, the goods and, on the other hand, the storage roll and receiver roll, and a cut-off and seaming means 10 (Fig. 3) for cutting and seaming the wrapper. Furthermore, the wrapping machine comprises a frame 31, e.g. a beam frame.

In the embodiment here depicted, the wrapper storage roll 4 has been placed in a particular, upright cassette or housing 32, rotatably, so that the wrapper storage roll 4 is enabled to rotate inside said housing. The end 8 of the wrapper projects out from the feed aperture of the cassette; the storage roll with cassette is shown in greater detail in Fig. 2. In Fig. 4, the storage roll 4 with its cassette 32 and the receiver roll 5 are provided with transport members 11, i.e., they are mounted on guide rails 45, e.g. with the aid of slides 46 (Fig. 4) or rollers to be movable towards each other. The transport members 11 are further provided, for instance, with a threaded screw or equivalent operating member 40, and with a power means 41, such as an electric motor, for moving the rolls towards each other and away from each other, carried by the guides 45.

In Fig. 2 is seen the storage roll 4 with its cassette 32 and the receiver roll 5 with its grabber 6, after being moved together. The wrapper end 8 is pushed along with the wrapper end guides 34, towards the receiver roll. The grabber 6 of the receiver roll, for instance a closing gap between roll halves, is open to receive the wrapper end 8. The receiver roll 5 is mounted on a particular roll fixer 35, rotatably, and provided with an operating means including power means 7 (Fig. 4).

The storage roll 4 with cassette 32 and the receiver roll 5 with roll fixer 35, such as its housing, and the roll transporting members, such as guides with operating members and power means, are mounted on a transport slide 12, this slide being further provided with a power means 13, including power transmission members, for moving the slide across the wrapping station, from its front side to the rear side. The transport means 9 with power and operating means consists, for instance, of a transport slide 12 movably mounted to be carried by guide rails 42, parallelling the direction 33 in which the transport means 2 operates, and moved by transport wheels 43 which are driven by an electric motor 13 (Fig. 4).

The cut-off and seaming device of the wrapping machine 1 is shown in detail in Fig. 3. The cut-off device comprises e.g. a cutter blade 37 with power means, such as an electric motor or a hydraulic cylinder 38; the cut-off device may also be furnished with a counter-blade for positive cutting. The seaming device comprises two seaming members 39 pushable against each other e.g. with the aid of cylinders 47 and their faces urged against each other being provided with a heating means, e.g. with an electric resistance.

In Fig. 4 is depicted a transport means 9 for the storage roll and the receiver roll belonging to an apparatus according to the invention. The transport means comprises guide rails 42 parallelling the transport direction of the goods transporting means which is part of the wrapping machine, and mounted on the base, the transport slide 12 being movably installed on said guides, running on wheels 43. The transport slide is provided with a power means 13, such as an electric motor, coupled over a transmission shaft 44 with the running wheels 43. The transport slide 12 comprises two horizontal, and parallel, guides, or rails, 45 disposed at right angles to the guides 42. The storage roll 4 with its housing 32 and the receiver roll

5 with roll fixer 35 and operating means 7 are both mounted to be borne on the guides of the transport slide 12, movably by means of slides 46. The transport slide is further provided with a power means 41 for moving the slides 46 and, thereby, the storage roll cassette 32 and the receiver roll 5, which have been mounted on them, relative to each other; the storage roll 4 with its cassette 32 has been depicted as dismounted in Fig. 4. Fig. 4 moreover shows the seaming device 10 with its seaming members 39.

When applying the procedure of the invention and the respective apparatus, one transports with the aid of the transport means 2 the goods to be wrapped, to the wrapping station 3, Fig. 1. As the goods passes by the measuring devices 14^1 and 14^2, the measuring device 14^1 measures the passage time of the goods and generates a signal characterizing that dimension of the goods which corresponds to the transporting direction 33; similarly as the piece of goods traverses the line of diodes 14^2, which is disposed at right angles against the direction of movement, this diode array generates a signal characterizing the dimension of the goods in the direction across the direction of movement 33; both signals are conducted to the control apparatus of the wrapping machine.

After the goods has moved to the wrapping station 3, the storage roll 4 and the receiver roll 5 move into positions as shown in Fig. 2, under control by the control apparatus. The wrapper end 8 goes through between the guides 34 and into the throat of the grabber 6 on the receiver roll, the grabber jaws are closed with the aid of the operating means, and the receiver roll is started in rotation. A length of wrapper approximately equivalent to half the peripheral dimension of the goods which was just measured, determined e.g. on the basis of the time of rotation or by means of a separate measuring device 15 and controlled by the control apparatus, is then taken up on the receiver roll. The reeling of wrapper on the receiver roll is now stopped, and one begins to move the storage roll and the receiver roll apart while wrapper material is discharged onto the respective side, that is the first side, of the goods; this discharge may be made from the storage roll and/or the receiver roll. When the storage roll and the receiver roll have moved past the front side of the goods to positions on its sides, the control apparatus stops the transport members of both rolls and starts the transport means 9, which serves to move the rolls 4 and 5 past the sides of the goods, at the same time unwinding wrapper material from both rolls and depositing it on the goods. When the rolls have moved all the way past the goods, the transport means 9 is stopped, and one begins once more to move the storage roll and the receiver roll towards each other, so that they are brought into the position of Fig. 3. Seaming and cutting of the wrapper are next accomplished with the cut-off and seaming device 10, under control by the control apparatus. The grabber 6 is released so that the wrapper end 8 comes free from the receiver roll. In a last step, the storage roll and the receiver roll are moved away from each other and returned to their initial positions. The finished, fully wrapped piece of goods is transported with the aid of the transport means 2, e.g. to a shrinking device 25, and further onto the goods line 26.

In Fig. 1 a solid arrow 50 has been entered to illustrate the movements of the storage roll 4 and the receiver roll 5. As revealed by the figures, the storage roll and the receiver roll are first moved towards each other in order to transfer the wrapper end from the storage roll to the receiver roll, thereafter away from each other, next past the goods and at the same time discharging wrapper from both rolls, then towards each other in order to perform the seaming and cut-off operation, and finally away from each other and back to initial position. This series of movements is accomplished under control of the control apparatus. It is equally possible, if desired, to employ in the apparatus a mechanical sensor or, for instance, a capacitive sensor for control of the rolls movements.

In Fig. 1 is further seen a height measuring member, e.g. a vertical line of photodiodes, or equivalent, for measuring the height of the goods to be wrapped. Furthermore, in the apparatus is seen a particular storage roll magazine 19, containing storage rolls of different heights in wrapper roll cassettes 20. The wrapping machine is moreover provided with a storage roll ejecting and transporting means 22, for transporting the storage roll with its cassette 32 to the transport station 49, indicated with dotted lines in the figure, and for transporting a new storage roll with cassette into the wrapping machine, corresponding to the goods height which the height measuring means 24 has found. To the purpose of changing cassettes, the storage roll magazine 19 may be provided e.g. with a mechanical or hydraulic transport means for moving any desired cassette into register with the wrapping machine 1 so that the storage roll presently in the wrapping machine can be moved to a vacant transport station 49, and further so that any desired storage roll presently in the magazine can be moved into the wrapping machine (the transport means is not described nor shown in greater detail in this context).

Furthermore, in Fig. 1 is seen a folding device 16 belonging to the wrapping machine 1 and mounted above the wrapping station, this folding means comprising at least one folding member 17, e.g. one such member for each side of the package, said members being arranged to fold the marginal part of the wrapper, projecting over the edge of the goods, down against the top face of the goods and/or over the goods with the end, or margin, of the top sheet projecting on one side lying against a side face of the goods and, if desired, to hot-seam said margin flap against the goods.

In Fig. 5 is seen the top sheet pulling means 51,

installed to be carried on the frame 31 of the wrapping apparatus. The pulling means comprises a top film roll 52, installed to be carried by a roll lifter 53. The roll lifter is lifted and lowered with the aid of an operating means 54, e.g. threaded rods or equivalent, driven by a power means. The end of the film is carried from the top film roll to a film holder 55. The top film puller 56 is installed to be carried on a pair of parallel rails 57, to be movable, and it is provided with grabbing members 58. The grabbing members are arranged to grasp the film and to pull it, with the aid of threaded screws or equivalent, driven by a drive means, e.g. by electric motors, over the top face of the goods that is being packaged. The guides 57 are provided with lifting means 59 for pulling the top film up to any desired height, in accordance with the goods or package that is being wrapped. The top sheet pulling means 51 further comprises a top sheet cut-off means, as has been shown e.g. in Fig. 3, or a film cutting means based on hot air blowing, or a sheet tearing means, etc. In Fig. 5 is further seen a roll stand, on which the top film roll 52 rests. - The roll lifter 53 may carry a plurality of rolls of different breadths, to suit various products and/or goods to be packaged.

When the top sheet pulling means is used, the top sheet is pulled over the goods, or package, prior to wrapping same. It is equally possible to pull the top sheet over the package after completing the wrapping. For the top sheet pulling operation, the guides. or rails, 57 and the top film roll 52 are lowered to a level consistent with the package. The grabbing members 58 of the top film pulling means grasp the film end held by the film holder 55 and pull it along the guides 57 over the goods. The film is cut off thereafter; the film may be held in place with the aid of a particular holding means exerting pressure from above. The top sheet may be seamed in place e.g. with the aid of the folding means 16, which has been disposed to press the overshooting marginal part of the top sheet against the goods.

The control apparatus of the apparatus of the invention, serving e.g. to receive the measuring signals and to move and control the rolls and their transport and operating means, and the transport slide, consists, for instance, of a conventional micro-circuit which has been arranged to control, electrically and/or pneumatically, the respective operating and power means. Similarly, the control apparatus may be arranged to control the transport means 2, the storage roll magazine 19, the shrink film apparatus 25, and the wrapping machine on the whole, and the entire process. The control technology is known in itself in the art and shall not be described in any greater detail in this context.

It is obvious that the procedure and apparatus of the invention, and the processes and members which belong to them, can be varied and modified within the scope of the claims following below.

Claims

1. A procedure for wrapping goods on a wrapping machine, the goods being transported to the wrapping station of the wrapping machine, the wrapper being horizontally wound around the goods and the wrapper being cut off and seamed, **characterized** in that the end of the wrapper is transferred from a substantially upright storage roll past the front of the goods to a receiver roll and wound thereupon, discharging wrapper material from said storage roll; the goods and, on the other hand, the storage roll and the receiver roll are moved relative to each other, discharging wrapper material from the storage roll and from the receiver roll so that the wrapper covers the sides of the goods; the storage roll and the receiver roll are moved towards each other behind the goods, discharging wrapper material; and the wrapper is cut off and seamed.

2. Procedure according to claim 1, **characterized** in that the length, and possibly the breadth, of the goods is measured prior to wrapping, and that onto the receiver roll is fed a length of wrapper material consistent with the measurement of the goods for wrapping the goods in the wrapper, accounting for the wrapper material which will be supplied onto the goods from the storage roll.

3. Procedure according to claim 1 or 2, **characterized** in that the storage roll and the receiver roll are moved towards each other in front of the goods; the wrapper end is grasped with a grabber on the receiver roll and the receiver roll is caused to rotate for winding wrapper material around the roll; the storage roll and the receiver roll are moved away from each other; and the goods and the storage roll and receiver roll are moved relative to each other between the storage roll and the receiver roll.

4. Procedure according to any one of claims 1-3, **characterized** in that the goods is transported to the wrapping station with the aid of a conveyor; in connection with the wrapping the storage roll and the receiver roll are moved towards each other, away from each other, past the sides of the goods and towards each other while the goods is stationary; and finally the wrapped goods is transported away from the wrapping station.

5. Procedure according to any one of claims 1-4, **characterized** in that the marginal portions of the wrapper projecting over the edge of the wrapped goods are folded against the goods with the aid of movable, and possibly heatable, folding members.

6. Procedure according to any one of claims 1-5, **characterized** in that the height of the goods is measured, the storage roll is selected and, if required, exchanged on the basis of said measurement conforming to the height of the goods.

7. Apparatus for wrapping goods (A) horizontally in a wrapper, comprising a wrapping machine (1) and a transport means (2) for transporting the goods to a wrapping station (3), **characterized** in that the wrapping machine (1) comprises a substantially upright wrapper storage roll (4); a substantially upright wrapper receiver roll (5) with grabber (6) and operating means (7) for grasping the end (8) of the wrapper and for winding wrapper material around said receiver roll; a transport means (9) for moving relative to each other, on one hand, the goods and, on the other hand, the storage roll and the receiver roll, at the same time discharging wrapper material from both rolls, to encircle the goods; and a cut-off and seaming device (10) for cutting off and seaming the wrapper that has been wound around the goods.

8. Apparatus according to claim 7, **characterized** in that the wrapper storage roll (4) and receiver roll (5) are movable relative to each other and provided with transport members (11) for moving them.

9. Apparatus according to claim 7 or 8, **characterized** in that the storage roll (4) and the receiver roll (5) are installed on a transport slide (12) provided with a power means (13) for moving said slide and both rolls relative to the goods (A).

10. Apparatus according to any one of claims 7-9, **characterized** in that the apparatus comprises a measuring device (14^1,14^2) for finding the horizontal dimensions of the goods, and a measuring member (15) for measuring the wrapper material to be wound on the receiver roll consistent with the measurement made on the goods and accounting for the wrapper which will be wrapped around the goods from the storage roll.

11. Apparatus according to any one of claims 7-10, **characterized** in that the apparatus comprises a folding means (16) with at least one movable folding member (17) arranged to fold against the goods the marginal parts of the wrapper which project over the edge of the goods (A).

12. Apparatus according to any one of claims 7-11, **characterized** in that the apparatus comprises a storage roll magazine (19) holding a plurality of storage rolls (20), and that the apparatus is provided with transport members (22) for removing the storage roll into said magazine and picking up a new roll from the magazine.

13. Apparatus according to claim 12, **characterized** in that the apparatus comprises a height measuring member (24) arranged to measure the height of the goods, and the transport members (22) are arranged to select and transport from the magazine (19) a roll consistent with the goods height that has been found.

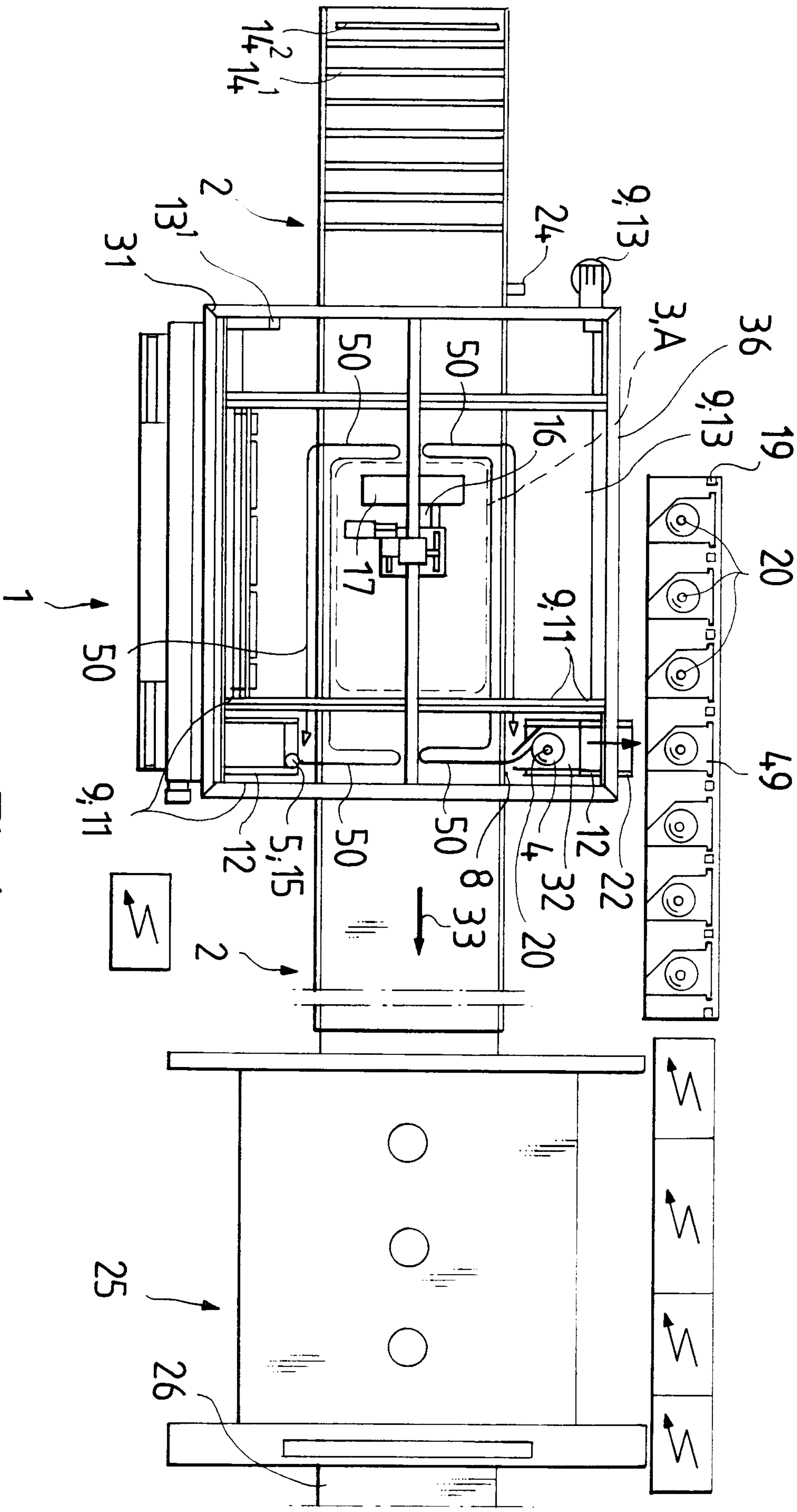
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Fig.1

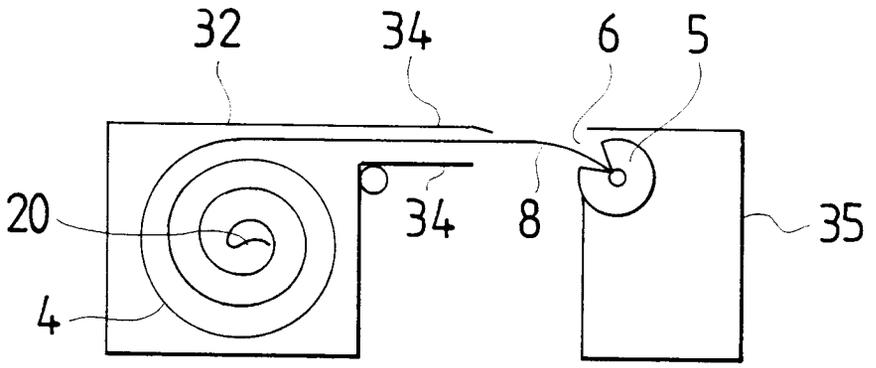

Fig.2

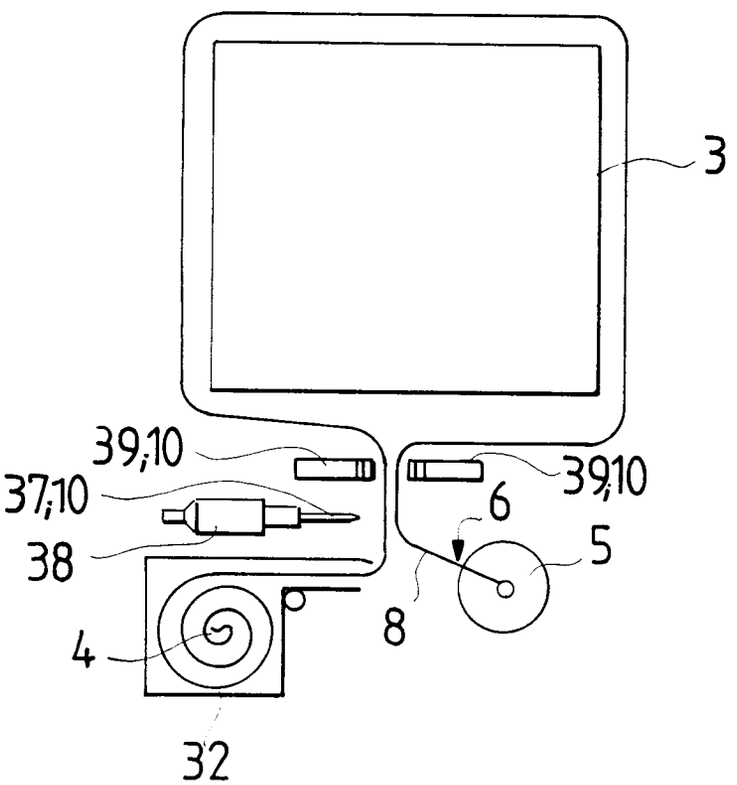

Fig.3

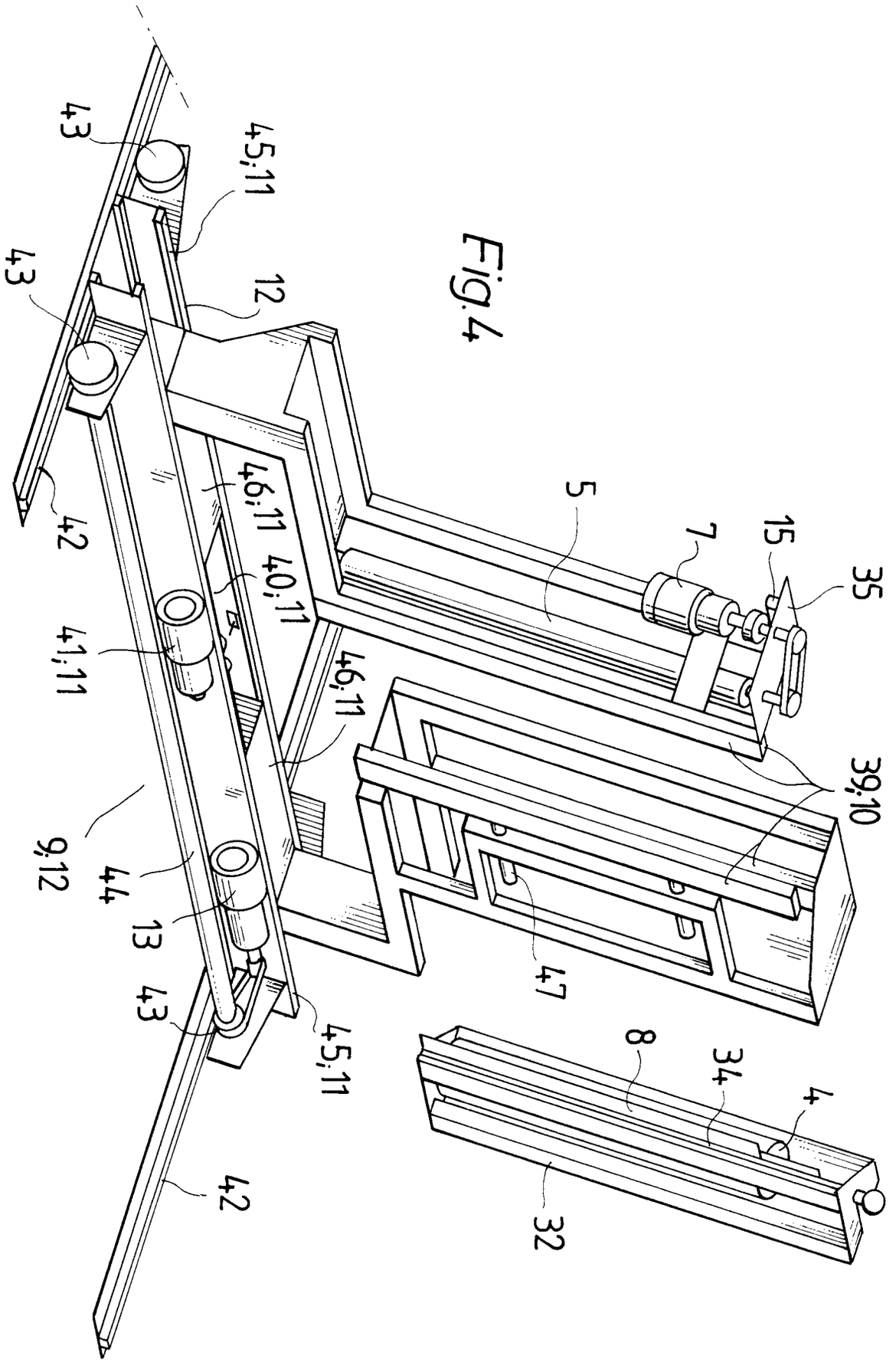
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Fig.4

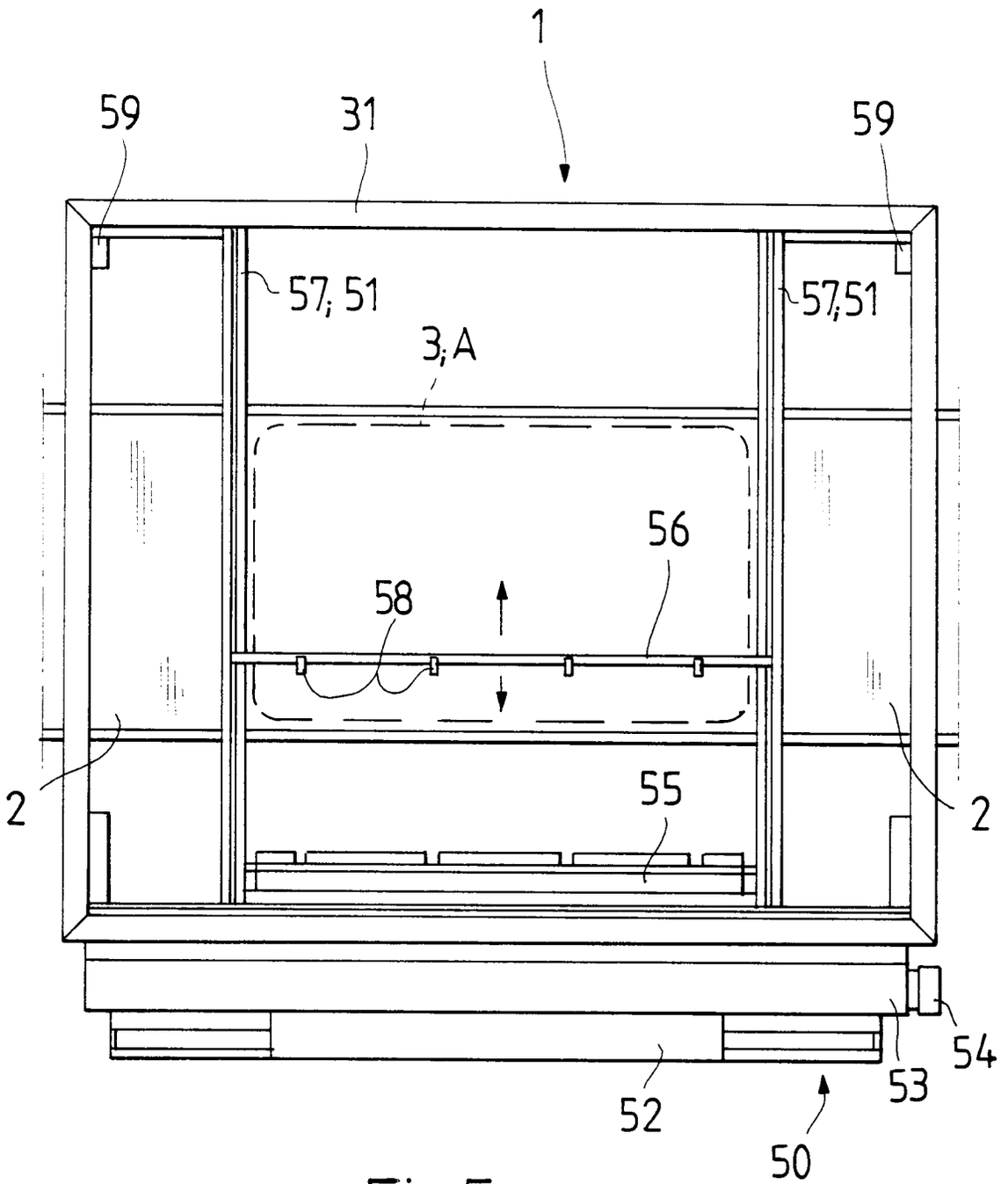

Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 85 0122

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	EP-A-0 270 426 (NEWTEC) * column 9, line 65 - column 11, line 6 * * figures 1-2G *	1-3, 6-10, 13	B65B11/02
Y	FR-A-2 208 377 (LEVANTE) * page 4, line 14 - page 6, line 37 * * figures 1-15 *	1-3, 6-10, 13	
A		4, 12	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 AUGUST 1992	CLAEYS H.C.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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E : earlier patent document, but published on, or after the filing date
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