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(54) Method and device for bagging a roll of web product

(57) The invention concerns a method and a device for inserting a roll of web product wound around a spindle.

The device according to the invention comprises: a) loading means (5, 6) for receiving said roll, said loading means comprising a bottom plate (5) and a side plate (6) substantially perpendicular to said bottom plate (5) so that a bag can be disposed on the roll through said open end, also enveloping said side plate; b) a support surface (7) mounted substantially horizontally; c) a motor (8) for pivoting the roll (arrow C) onto the support surface (7); and d) means for retracting said bottom plate, thereby enabling the roll to be pushed to the bottom of the bag.

Application to the bagging of photographic products.

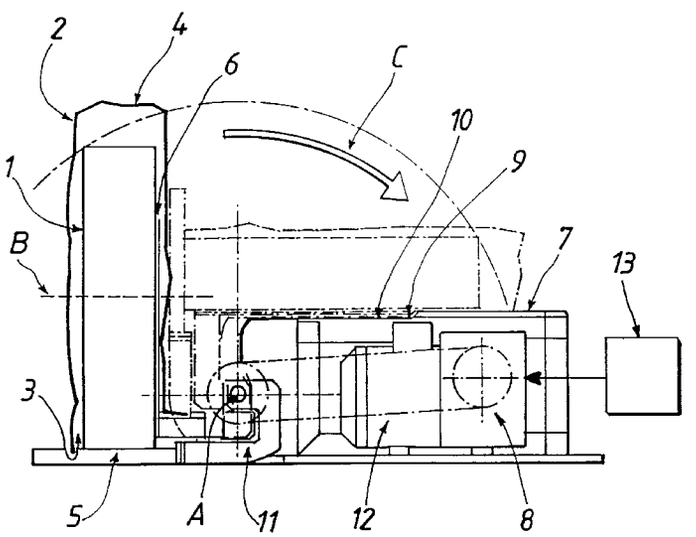

FIG.2

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Description

The invention concerns a method and a device for bagging a roll of web product, and concerns in particular the bagging of photographic web products such as photographic paper, this application being given only by way of example.

In the field of the photographic industry, certain products (such as photographic paper) are packaged in the form of rolls whose diameter typically varies between 240 mm and 430 mm, with a strip width varying between 89 mm and 210 mm. The weight of such rolls varies between 3 and 15 kg.

Typically, such rolls are packed in light-proof bags (for example, a black paper/polyethylene complex). This bagging operation is generally carried out manually, by an operator who has to handle the roll under difficult conditions in order to insert it into the bag. The operator then folds the free end of the bag and applies an adhesive thereto, enabling the bag to be held in the closed position. Aside from its difficult nature due to the weight of the rolls, this operation requires a great deal of time. Furthermore, the edges of the strip, notably at the periphery of the roll, can be damaged during such handling operations, rendering a sometimes significant length of the strip unusable.

One of the objects of the present invention is thus to provide a method and device which substantially facilitate the bagging of rolls of web products.

Another object of the present invention is to provide a method and a device which substantially reduce the risk of damage to the product to be bagged.

A further object of the present invention is to permit the automation of all or part of the operation of bagging such rolls.

Still further objects will appear in detail in the description that follows.

These objects are achieved, according to the present invention, by means of a device for inserting a roll of web product wound around an axis into a bag having one open end and one closed end, the device comprising:

a) loading means for receiving the said roll so that the axis of the roll is substantially horizontal, the loading means comprising a bottom plate and a side plate substantially perpendicular to the bottom plate so that a bag can be disposed on the roll through the said open end, also enveloping the side plate;
b) a support surface mounted substantially horizontally, adjacent to the loading means;
c) a motor for driving the loading means so as to cause the roll to pivot onto the support surface and grip one of the faces of the bag between the support surface and the side plate; and
d) means for retracting the bottom plate so as to clear the open end of the bag, thereby enabling the roll to be pushed to the bottom of the bag.

Advantageously, means are provided for automatically pushing the roll to the bottom of the bag.

According to an advantageous alternative of the invention, the support surface has a recess adapted to receive the side plate so that the surface of the side plate in contact with the roll is substantially in line with the non-recessed part of the support surface.

Advantageously, the motor is a bidirectional-rotation motor, coupled to the bottom plate, a first direction of rotation of the motor enabling the roll to be pivoted onto the support surface, the second direction of rotation enabling the bottom plate to be retracted.

Also advantageously, it moreover comprises means for automatically producing a fold at the open end of the bag so as to close the bag.

According to a further alternative, it moreover comprises means for automatically disposing an adhesive on the fold so as to keep the bag in the closed position.

According to the present invention, a method is also produced for inserting a roll of web product wound around an axis into a bag having one open end and one closed end, the device comprising:

a) disposing the roll on loading means so that the axis of the roll is substantially horizontal, the loading means comprising a bottom plate and a side plate substantially perpendicular to the bottom plate, a support surface mounted substantially horizontally being disposed adjacent to the loading means;
b) disposing the bag on the roll through the said open end so as to also envelop the side plate;
c) driving the loading means so as to cause the roll to pivot onto the support surface and grip one of the faces of the bag between the support surface and the side plate;
d) retracting the said bottom plate so as to clear the open end of the bag; and
e) pushing the roll to the bottom of the bag.

In the description that follows, reference will be made to the drawings, amongst which:

- Figure 1 depicts an overall view of a preferred embodiment of the bagging device according to the invention;
- Figure 2 depicts another view of the device depicted in Figure 1; and
- Figures 3A-3F illustrate the operation of a preferred embodiment of the device according to the invention.

Figures 1 and 2, to which reference is now made, illustrate diagrammatically an advantageous embodiment of the bagging device according to the invention.

According to this embodiment, the device comprises a loading device having a bottom plate 5 and a side plate 6 substantially perpendicular to the bottom plate. A roll is placed vertically on the plate 5 bearing against

the side plate 6. Within the meaning of the present application, the term vertically expresses the fact that the roll has a substantially horizontal winding axis (B). The bottom plate is coupled by means of an intermediate part 11 to a motor 8 by means, for example, of a belt 12. The side plate 6 is, according to the embodiment illustrated, mounted independently of the bottom plate but is designed so as to be driven by the pivoting movement of the bottom plate (in the direction indicated by the arrow C). On the other hand, the reverse movement of the bottom plate, which, as will be seen hereinafter, is designed to clear the open end of the bag, does not drive the side plate, this being returned to the vertical position manually. Advantageously, it is possible to provide for the automatic raising of the side plate 6 to its initial loading position.

In the embodiment depicted in Figure 1, the side plate 6 is provided with an oblong hole 15, disposed so as to coincide substantially with the core of the roll so as to be able to insert therein an insert or plug designed to stiffen the roll of web product.

Once the roll has been loaded onto the plate 5, an operator places a bag 2 on top, also enclosing the side plate 6 in the bag. The roll is then pivoted by means of the motor 8 onto the support surface 7 adjacent to the loading means, thereby gripping the corresponding face of the bag 2 between the support 7 and the lateral bag 6. The side plate has a surface area sufficient, firstly, to hold the roll correctly during its pivoting movement onto the surface 7, and secondly, to hold the bag adequately when the roll is pushed to the bottom 4 of the bag. In Figure 2, the loading means 5, 6, 11 and the roll 1 are depicted in the initial position, substantially vertical (unbroken lines) and in the pivoted position, substantially horizontal (broken lines).

According to a preferred embodiment, the motor is controlled so as to rotate in a first direction of rotation to pivot the roll 1 onto the support surface 7, detection means being provided to detect the end of travel of the roll. At this moment, the control means 13 reverse the direction of rotation of the motor so as to return the bottom plate 5 to its horizontal loading position, means also being provided for detecting the end of travel of the plate.

Advantageously, the plate 7 has a recess 9 designed to receive the side plate 6 after tilting, the recess being such that the surface of the side plate 6 in contact with the roll 1 is substantially aligned with the non-recessed surface of the plate 7. This improves the holding of the bag, and furthermore, when the roll is pushed to the bottom of the bag, prevents any risk of damage to the final turns of the roll, which, in the absence of this recess 9, would project. For certain applications, however, this is not critical.

As can be seen in Figure 1, the support surface 7 defines, with the other lateral surfaces 13, 14, a protective housing for the motor 8.

When the roll is pivoted onto the support surface 7, and after the free end of the bag has been cleared by retracting the plate 5, the roll 1 is pushed to the bottom of the bag, either by an operator, or automatically by means of a pushing device controlled, for example, by a ram (not shown). As mentioned above, with the bag held gripped between the surface 7 and the plate 6 under the effect of the weight of the roll, it does not move appreciably when the roll is pushed to the bottom of the bag. The bag can then be removed from the bagging station.

In order to automate the roll bagging line completely, means (not shown) are advantageously provided, downstream of the device, for producing a fold at the open end of the bag. Means (not shown) can also be provided for applying an adhesive to the fold so as to hold the bag in the closed position.

Figures 3A-3F, to which reference is now made, illustrate diagrammatically the operation of the bagging device according to the invention.

In Figure 3A, the roll 1 is placed on the plate 5 in abutment against the side plate 6. The roll is in a substantially vertical position.

In Figure 3B, a bag 2 is disposed by its open end on the roll 1 so as to also enclose the side plate 6. The motor 8 is actuated so as to cause the plate 5 (and the roll) to pivot in a controlled manner about the axis A onto the support surface 7.

In Figure 3C, the roll is in a substantially horizontal position on the surface 7, a part of the bag being wedged between the surface 7 and the side plate 6. The motor 8 is actuated so as to drive the bottom plate 5 in the opposite direction so as to clear the open end of the bag 1.

In Figure 3D, the open end 3 of the bag 1 is cleared. The bottom plate 5 is again in its initial position.

In Figure 3E, the roll 1 is pushed to the bottom of the bag, either manually or in an automated manner.

In Figure 3F, the loaded bag has been removed from the bagging device. The side plate is pivoted back into its initial, substantially vertical position. The device is again ready for a further loading cycle.

The device that has just been described is particularly advantageous in that it enables the operation of bagging rolls of web products to be facilitated and automated. Furthermore, it considerably limits any risk of damage to the product to be bagged.

In the above description, reference was made to preferred embodiments of the invention. It is evident that variants can be made thereto without departing from the spirit of the invention as claimed hereinafter. By way of example, the side plate 6 is disposed opposite the other face of the roll, the roll being held while it tilts towards the surface 7 by the action of the bag 2, which bag also envelops the side plate.

Claims

1. Device for inserting a roll of web product wound around an axis into a bag (2) having one open end (3) and one closed end (4), said device comprising:

   a) loading means (5, 6) for receiving said roll so that the axis (B) of the roll is substantially horizontal, said loading means comprising a bottom plate (5) and a side plate (6) substantially perpendicular to said bottom plate (5) and being arranged so that a bag can be disposed on the roll through said open end, also enveloping said side plate;
   b) a support surface (7) mounted substantially horizontally, adjacent to the loading means (5, 6);
   c) a motor (8) for driving the loading means (5, 6) so as to cause the roll to pivot (arrow C) onto the support surface (7) and grip one of the faces (10) of the bag between the support surface (7) and the side plate; and
   d) means for retracting said bottom plate so as to clear the open end of the bag, thereby enabling the roll to be pushed to the bottom of the bag.

2. Device according to Claim 1, characterised in that it moreover comprises means for automatically pushing the roll to the bottom of the bag.

3. Device according to Claim 1 or 2, characterised in that the support surface (7) has a recess (9) adapted to receive the lateral plate (6) so that the surface of the lateral plate in contact with the roll is substantially aligned with the non-recessed part of the support surface (7).

4. Device according to any one of Claims 1 to 3, characterised in that the motor (8) is a bidirectional- rotation motor, coupled to the bottom plate (5), a first direction of rotation of the motor enabling the roll to be pivoted onto the support surface, the second direction of rotation enabling the bottom plate (5) to be retracted.

5. Device according to any one of Claims 1 to 4, characterised in that it further comprises means for automatically producing a fold at the open end of the bag so as to close the said bag.

6. Device according to Claim 5, characterised in that it further comprises means for automatically applying an adhesive to the fold so as to keep the bag in the closed position.

7. Method for inserting a roll of web product wound around an axis into a bag (2) having one open end (3) and one closed end (4), said device comprising:

   a) disposing the roll on loading means (5, 6) so that the axis (B) of the roll is substantially horizontal, said loading means comprising a bottom plate (5) and a side plate (6) substantially perpendicular to said bottom plate (5), a support surface (7) mounted substantially horizontally being disposed adjacent to the loading means (5, 6);
   b) disposing the bag (2) on the roll (1) through said open end (3) so as to also envelop said side plate;
   c) driving the loading means (5, 6) so as to cause the roll to pivot (arrow C) onto the support surface (7) and grip one of the faces (10) of the bag between the support surface (7) and the side plate;
   d) retracting said bottom plate so as to clear the open end of the bag; and
   e) pushing the roll to the bottom of the bag.

8. Method according to Claim 7, characterised in that it further comprises the following step:
   f) producing a fold at the open end of the bag so as to close said bag.

9. Method according to Claim 8, characterised in that it further comprises the following step:
   g) disposing an adhesive on the fold so as to keep the bag in the closed position.

10. Method according to any one of Claims 7 to 9, characterised in that said web product is a light-sensitive product, the bag being produced from a light-proof material.

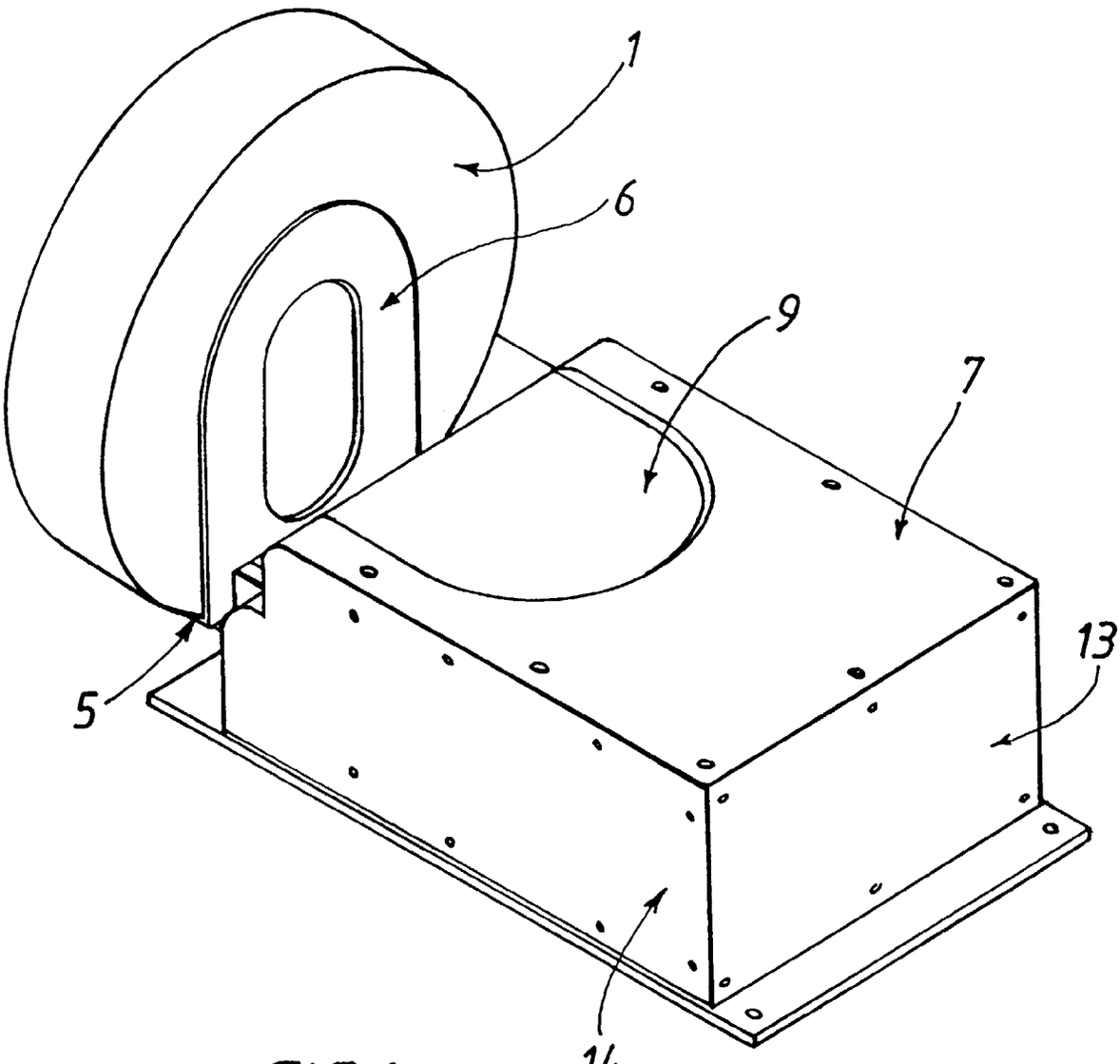

FIG.1

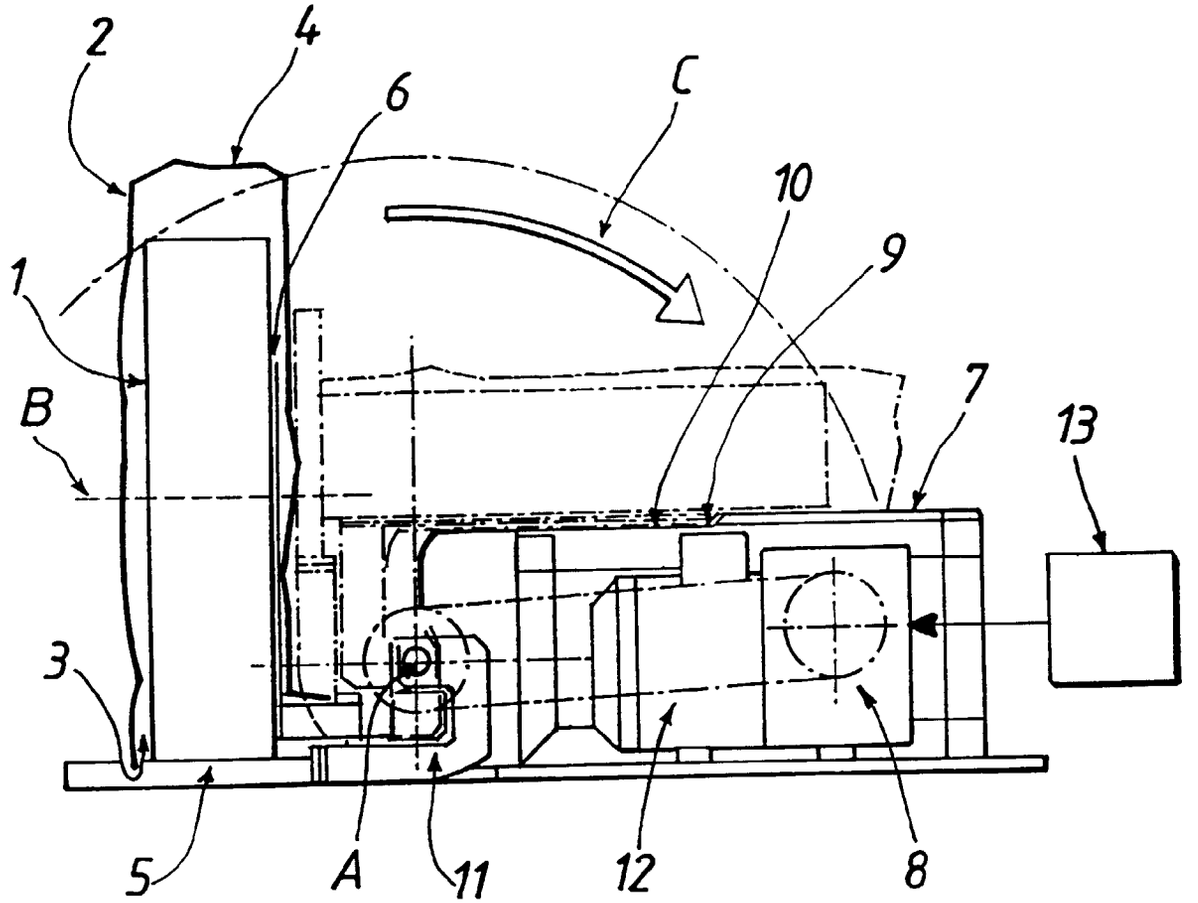

FIG.2

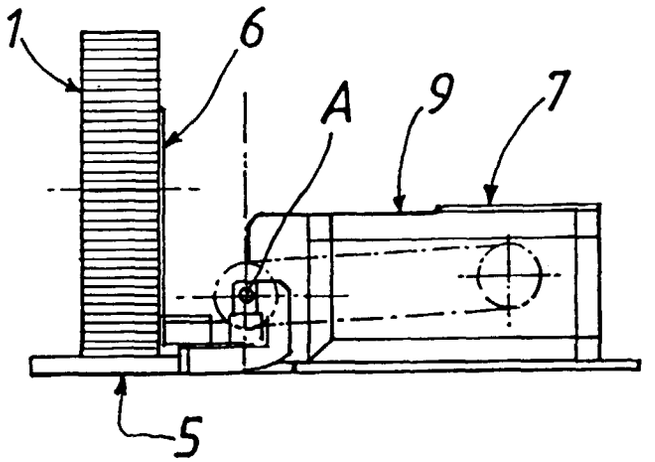

FIG.3A

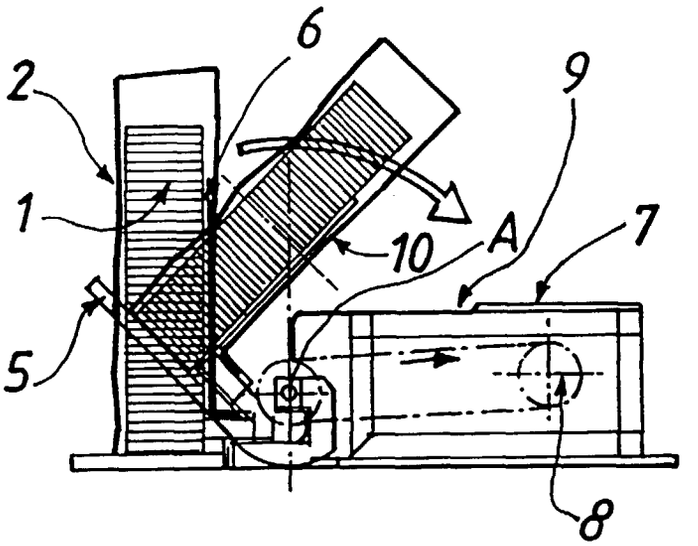

FIG.3B

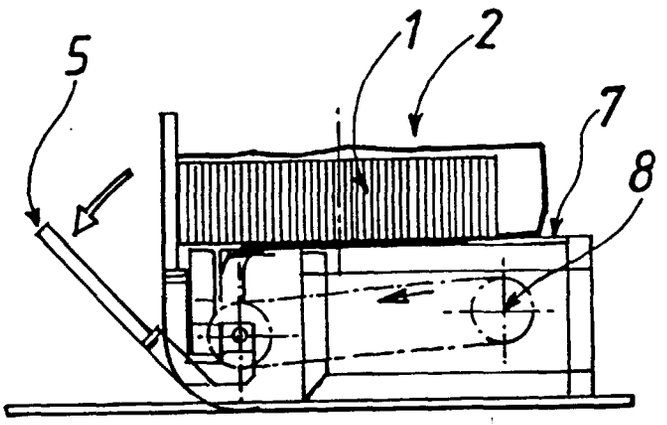

FIG.3C

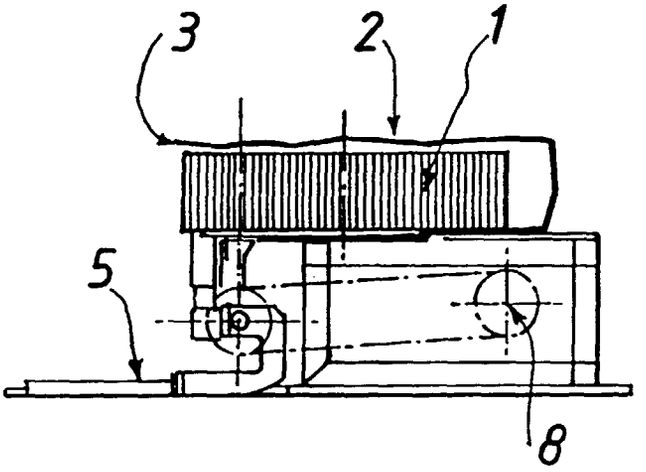

FIG.3D

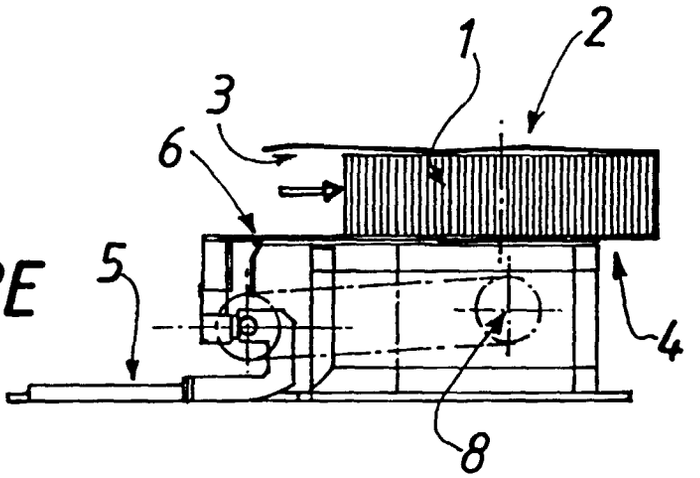

FIG.3E

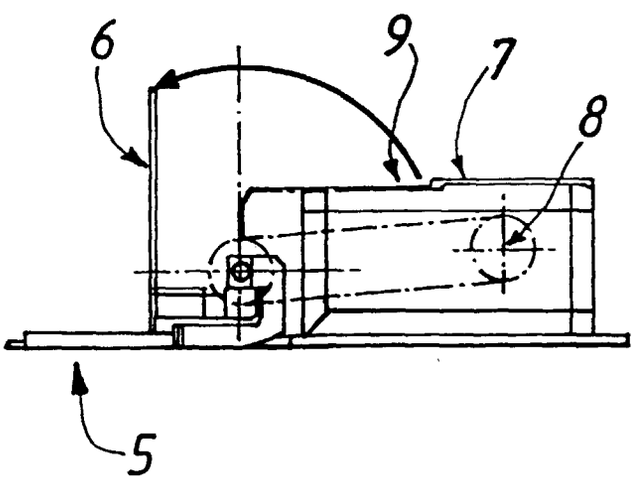

FIG.3F

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 42 0353

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.6)
A	US 4 833 861 A (HALE) * the whole document * ---	1,7	B65B5/04 B65B67/04
A	US 3 473 290 A (CULPEPPER) * abstract; figures 1,3 * -----	1,7	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 March 1997	Claeys, H

CATEGORY OF CITED DOCUMENTS

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