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

Verfahren und Vorrichtung zum Verpacken einer Rolle Bandmaterial in einem Sack

Procédé et dispositif pour la mise en sachet d'un rouleau de matériau en bande

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US-A- 3 473 290 **US-A- 4 833 861**

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Description

[0001] 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.

[0002] 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.

[0003] 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.

[0004] 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.

[0005] 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.

[0006] A further object of the present invention is to permit the automation of all or part of the operation of bagging such rolls.

[0007] Still further objects will appear in detail in the description that follows.

[0008] 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.

[0009] Advantageously, means are provided for automatically pushing the roll to the bottom of the bag.

[0010] 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.

[0011] 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.

[0012] Also advantageously, it moreover comprises means for automatically producing a fold at the open end of the bag so as to close the bag.

[0013] 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.

[0014] 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.

[0015] 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.

[0016] Figures 1 and 2, to which reference is now made, illustrate diagrammatically an advantageous embodiment of the bagging device according to the invention.

[0017] 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.

[0018] In the embodiment depicted in Figure 1, the side plate 6 is provided with an oblong hole, 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.

[0019] 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 side plate 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).

[0020] 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.

[0021] 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.

[0022] As can be seen in Figure 1, the support surface 7 defines, with the other lateral surfaces 14, 15, a protective housing for the motor 8.

protective housing for the motor 8.

[0023] 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.

[0024] 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.

[0025] Figures 3A-3F, to which reference is now made, illustrate diagrammatically the operation of the bagging device according to the invention.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] In Figure 3D, the open end 3 of the bag 2 is cleared. The bottom plate 5 is again in its initial position.

[0030] In Figure 3E, the roll 1 is pushed to the bottom of the bag, either manually or in an automated manner.

[0031] 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.

[0032] 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.

[0033] 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 scope of the invention as claimed hereinafter.

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 hori-

zontal, 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.

Patentansprüche

1. Vorrichtung zum Einsetzen einer Rolle (1) eines um eine Achse gewickelten bahnförmigen Materials in eine Hülle (2) mit einem offenen Ende (3) und einem geschlossenen Ende (4), **gekennzeichnet durch**
 - a) Beschickungsmittel (5, 6) zum Aufnehmen der Rolle derart, dass sich die Rollennachse (B) im wesentlichen horizontal erstreckt, wobei die Beschickungsmittel eine Bodenplatte (5) und eine dazu im wesentlichen senkrechte Seitenplatte (6) aufweisen und derart angeordnet sind, dass die Hülle mit ihrem offenen Ende über der Rolle anordenbar ist und dabei die Seitenplatte umschließt,
 - b) eine Auflagefläche (7), die im wesentlichen horizontal und den Beschickungsmitteln (5, 6) benachbart angeordnet ist,
 - c) einen Motor (8) zum Antreiben der Beschickungsmittel (5, 6), wobei der Motor eine Schwenkbewegung der Rolle (Pfeilrichtung C) auf die Auflagefläche (7) bewirkt und eine der Seiten der Hülle zwischen der Auflagefläche (7)

und der Seitenplatte erfasst, und
d) Mittel zum Zurückziehen der Bodenplatte
derart, dass das offene Ende der Hülle frei ist,
wodurch die Rolle in diese hineinschiebbar ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass die Vorrichtung Mittel zum automatischen Hineinschieben der Rolle in die Hülle aufweist.

3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass die Auflagefläche (7) eine Aussparung (9) aufweist, in der die Seitenplatte (6) derart aufnehmbar ist, dass die mit der Rolle in Berührung befindliche Fläche der Seitenplatte im wesentlichen mit dem nicht ausgesparten Teil der Auflagefläche (7) ausgerichtet ist.

4. Vorrichtung nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, dass der mit der Bodenplatte (5) verbundene Motor (8) in seiner Drehrichtung umkehrbar ist, wobei in der ersten Drehrichtung die Rolle auf die Auflagefläche schwenkbar ist und in der zweiten Drehrichtung die Bodenplatte (5) zurückziehbar ist.

5. Vorrichtung nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, dass die Vorrichtung Mittel aufweist zum automatischen Herstellen eines Falzes am offenen Ende der Hülle derart, dass diese schließbar ist.

6. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, dass die Vorrichtung Mittel aufweist zum automatischen Aufbringen eines Klebstoffes auf die Falzung derart, dass die Hülle in ihrem geschlossenen Zustand haltbar ist.

7. Verfahren zum Einsetzen einer Rolle (1) eines um eine Achse gewickelten bahnförmigen Materials in eine Hülle (2) mit einem offenen Ende (3) und einem geschlossenen Ende (4), **gekennzeichnet durch** die Schritte:

- a) Anordnen der Rolle auf Beschickungsmitteln (5, 6) derart, dass die Rollennachse (B) sich im wesentlichen horizontal erstreckt, wobei die Beschickungsmittel eine Bodenplatte (5) und eine dazu im wesentlichen senkrechte Seitenplatte (6) aufweisen und wobei eine im wesentlichen horizontale Auflagefläche (7) den Beschickungsmitteln (5, 6) benachbart angeordnet ist,
b) Anordnen der Hülle (2) mit ihrem offenen Ende (3) auf der Rolle (1) derart, dass die Hülle auch die Seitenplatte umschließt,
c) Antreiben der Beschickungsmittel (5, 6) derart, dass die Rolle eine Schwenkbewegung

(Pfeilrichtung C) auf die Auflagefläche (7) ausführt und eine der Seiten der Hülle zwischen der Auflagefläche (7) und der Seitenplatte erfasst,

- d) Zurückziehen der Bodenplatte derart, dass das offene Ende der Hülle frei ist, und
e) Einschieben der Rolle in die Hülle.

8. Verfahren nach Anspruch 7, gekennzeichnet durch den Schritt:

f) Herstellen eines Falzes am offenen Ende der Hülle derart, dass diese schließbar ist.

9. Verfahren nach Anspruch 8, gekennzeichnet durch den Schritt:

g) Aufbringen eines Klebstoffes auf den Falz derart, dass die Hülle in ihrem geschlossenen Zustand haltbar ist.

10. Verfahren nach einem der Ansprüche 7 bis 9, dadurch gekennzeichnet, dass das bahnförmige Material ein lichtempfindliches Material ist und dass die Hülle aus einem lichtdichten Material hergestellt ist.

Revendications

1. Dispositif pour introduire un rouleau de produit en bande enroulé autour d'un axe, dans un sac (2) présentant une extrémité ouverte (3) et une extrémité fermée (4), ledit dispositif comprenant:

a) des moyens de chargement (5, 6) pour recevoir ledit rouleau de sorte que l'axe (B) du rouleau soit sensiblement horizontal, lesdits moyens de chargement comprenant une plaque inférieure (5) et une plaque latérale (6) sensiblement perpendiculaire à ladite plaque inférieure (5) et étant arrangés de sorte qu'un sac puisse être disposé sur le rouleau au travers de ladite extrémité ouverte, en enveloppant également ladite plaque latérale;

b) une surface de support (7) montée sensiblement horizontalement, adjacente aux moyens de chargement (5,6);

c) un moteur (8) pour entraîner les moyens de chargement (5, 6) de manière à faire pivoter le rouleau (flèche C) sur la surface de support (7) et à pincer l'une des faces (10) du sac entre la surface de support (7) et la plaque latérale; et
d) des moyens pour escamoter ladite plaque inférieure de manière à dégager l'extrémité ouverte du sac, permettant ainsi de pousser le rouleau au fond du sac.

2. Dispositif selon la revendication 1 caractérisé en ce qu'il comprend en plus des moyens pour pousser automatiquement le rouleau au fond du sac.

3. Dispositif selon la revendication 1 ou 2 caractérisé en ce que la surface de support (7) présente un renforcement (9) adapté pour recevoir la plaque latérale (6) de manière à ce que la surface de la plaque latérale en contact avec le rouleau soit sensiblement dans le prolongement de la partie non renforcée de la surface de support (7). 5
4. Dispositif selon l'une quelconque des revendications 1 à 3 caractérisé en ce que le moteur (8) est un moteur à rotation bidirectionnelle, couplé à la plaque inférieure (5) un premier sens de rotation du moteur permettant de faire pivoter le rouleau sur la surface de support, le second sens de rotation permettant d'escamoter la plaque inférieure (5). 10 15
5. Dispositif selon l'une quelconque des revendications 1 à 4 caractérisé en ce qu'il comprend en plus des moyens pour réaliser automatiquement un pli au niveau de l'extrémité ouverte du sac de manière à fermer ledit sac. 20
6. Dispositif selon la revendication 5 caractérisé en ce qu'il comprend en plus des moyens pour apposer automatiquement un adhésif au niveau du pli de manière à maintenir le sac en position fermée. 25
7. Procédé pour introduire un rouleau de produit en bande enroulé autour d'un axe, dans un sac (2) présentant une extrémité ouverte (3) et une extrémité fermée (4), ledit dispositif comprenant: 30
 - a) disposer le rouleau sur des moyens de chargement (5, 6) de sorte que l'axe (B) du rouleau soit sensiblement horizontal, lesdits moyens de chargement comprenant une plaque inférieure (5) et une plaque latérale (6) sensiblement perpendiculaire à ladite plaque inférieure (5), une surface de support (7) montée sensiblement horizontalement, étant disposée de manière adjacente aux moyens de chargement (5,6); 35 40
 - b) disposer le sac (2) sur le rouleau (1) au travers de ladite extrémité ouverte (3) de manière à envelopper également ladite plaque latérale;
 - c) entraîner les moyens de chargement (5, 6) de manière à faire pivoter le rouleau (flèche C) sur la surface de support (7) et à pincer l'une des faces (10) du sac entre la surface de support (7) et la plaque latérale; 45
 - d) escamoter ladite plaque inférieure de manière à dégager l'extrémité ouverte du sac; et 50
 - e) pousser le rouleau au fond du sac.
8. Procédé selon la revendication 7 caractérisé en ce qu'il comprend en plus l'étape suivante: 55
 - f) réaliser un pli au niveau de l'extrémité ouverte du sac de manière à fermer ledit sac.
9. Procédé selon la revendication 8 caractérisé en ce qu'il comprend en plus l'étape suivante:
 - g) disposer un adhésif au niveau du pli de manière à maintenir le sac en position fermée.
10. Procédé selon l'une quelconque des revendications 7 à 9 caractérisé en ce que le dit produit en bande est un produit photosensible, le sac étant réalisé en un matériau étanche à la lumière.

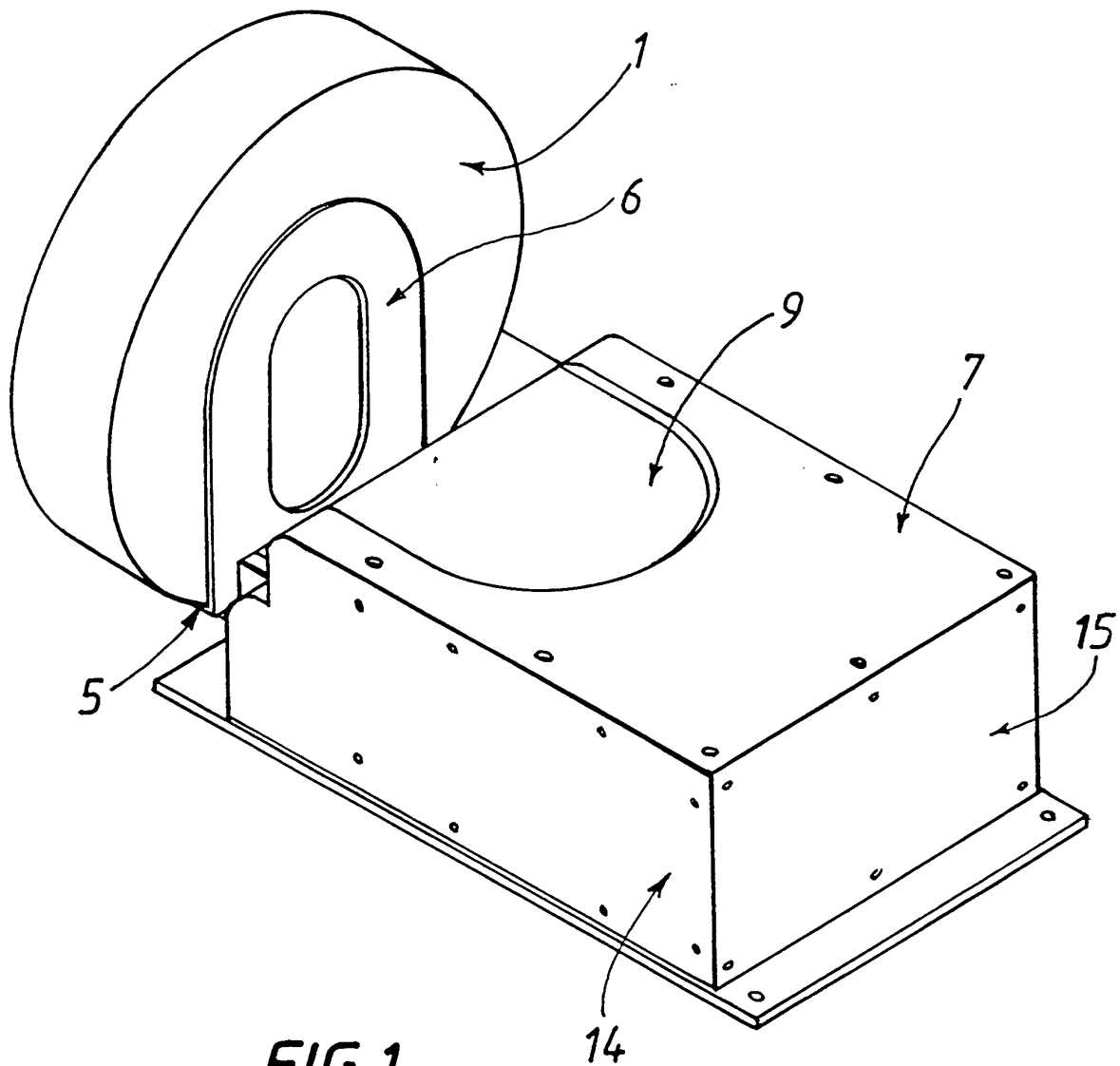


FIG.1

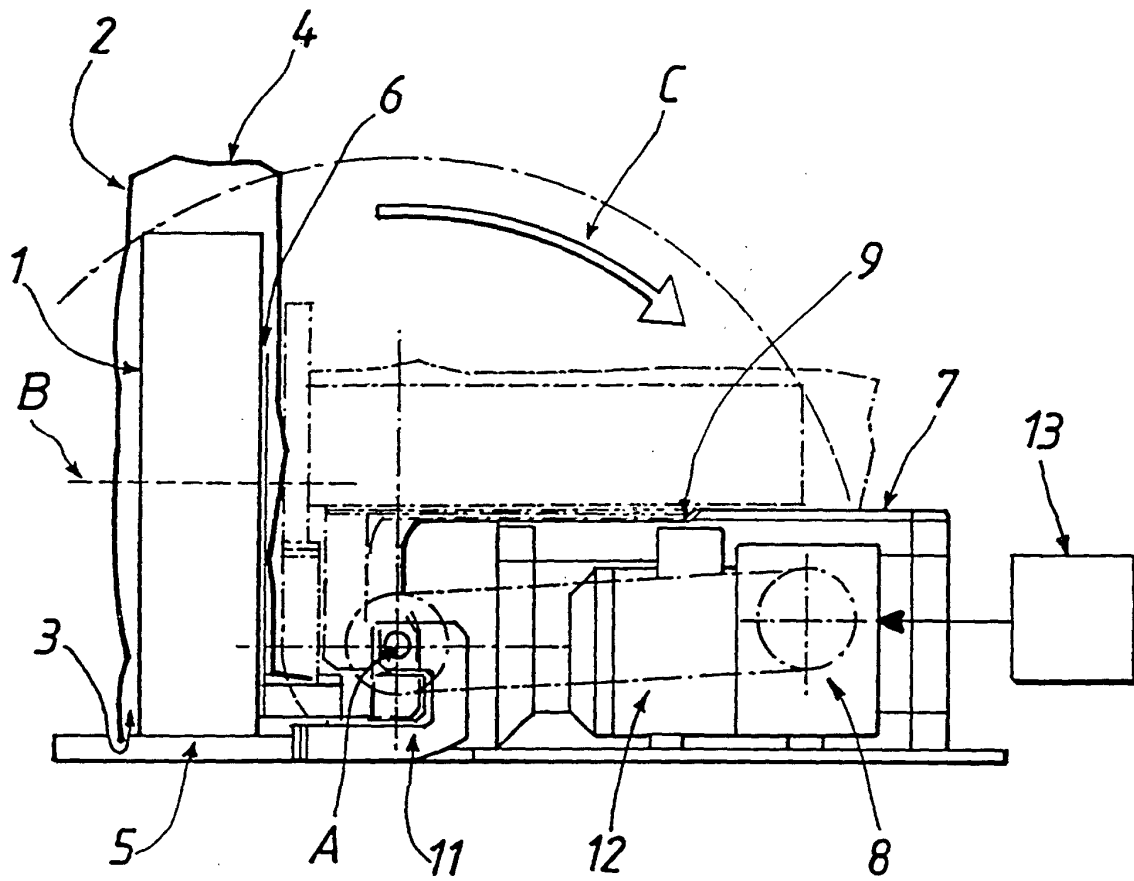


FIG.2

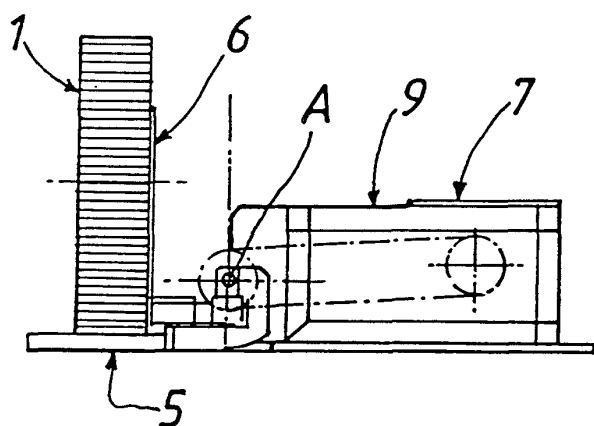


FIG. 3A

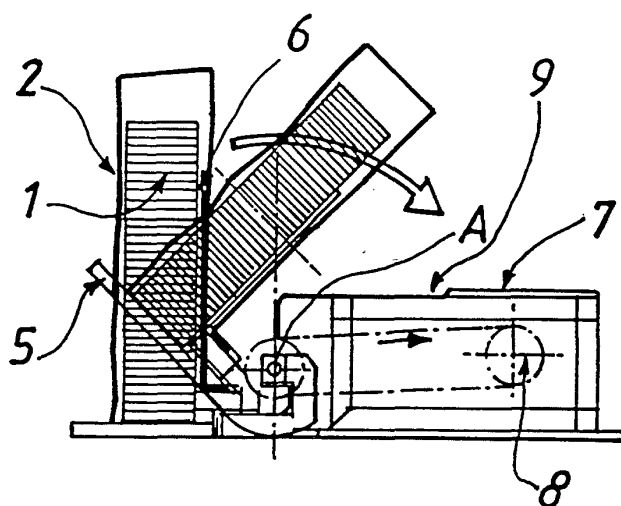


FIG. 3B

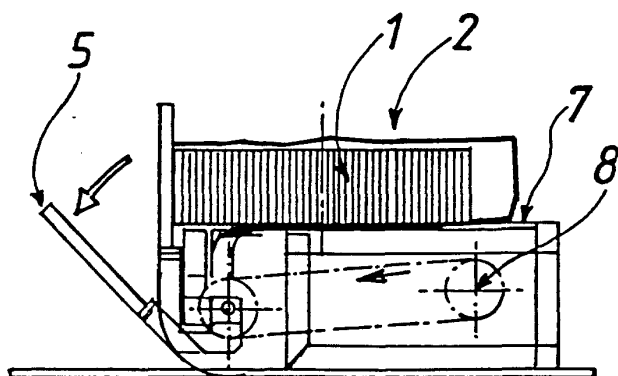


FIG. 3C

