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(54) **FORM FILL SEAL PROCEDURE FOR PACKAGING ARTICLES IN BAG FILLED WITH AIR**

FORM FULL SIEGEL VERFAHREN ZUR VERPACKUNG VON ARTIKEL IN LUFT GEFÜLLTE BEUTEL

PROCEDE POUR FORMER REMPLIR SCELLER POUR EMBALLER DES ARTICLES DANS UN SAC GONFLE D'AIR

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Description

Technical Field

[0001] The present invention relates to a procedure for packaging articles.

Background Art

[0002] As is known, certain articles are put on the market in a package which may consist of a bag, a box or the like.

[0003] Articles packed in boxes are usually more protected than articles packed in bags.

[0004] The bags, in fact, usually consist of a flexible packaging sheet which, folded on itself, covers the articles. Int. Pub. WO 2010/131063 A1 discloses a procedure for packaging articles comprising the steps of:

- providing a packaging sheet having a longitudinal extension and two longitudinal edges;
- moving said packaging sheet forward along a direction of forward movement substantially parallel to said longitudinal extension;
- arranging a plurality of articles on said packaging sheet at a reciprocal distance along said direction of forward movement;
- moving said longitudinal edges close to each other to form a substantially tubular section of said packaging sheet having an open extremity and said articles inside;
- blowing an inert gas in said substantially tubular section through said open extremity;
- sealing said longitudinal edges together longitudinally;
- sealing transversally said substantially tubular section downstream and upstream of each of said articles to form a plurality of closed packages containing said articles.

[0005] During the transport and distribution of the articles on the market, therefore, because of the flexibility of the packaging sheet, the bag can be crushed and hit in such a way that even small strokes can jeopardize the integrity of the articles inside it.

[0006] To this must be added that in some cases the article contained in the bag consists of a so-called "surprise product", that is, an object that is distributed on the market so as not to be immediately recognizable from its packaging and that is discovered only after purchasing once the bag has been removed.

[0007] In these cases, however, the flexibility of the packaging sheet allows any purchaser to crush the bag without breaking it, folding it with the fingers for the purpose of touching the article inside.

[0008] By so doing, therefore, it is possible to recognize the article even without removing the package, completely ruining the surprise.

Description of the Invention

[0009] The main aim of the present invention is to provide a procedure for packaging articles that allows to pack articles so that they can be transported and distributed under greater safety conditions for their integrity and, in the case of "surprise products", so as to avoid that potential buyers can recognize the article without removing the package.

[0010] Another object of the present invention is to provide a procedure for packaging articles which can overcome the above mentioned drawbacks of the prior art in the ambit of a simple, rational, easy and effective to use as well as low cost solution.

[0011] The above mentioned objects are achieved by the procedure for packaging articles according to claim 1.

Brief Description of the Drawings

[0012] Other characteristics and advantages of the present invention will become evident from the description of a preferred but not exclusive embodiment of a machine that realizes the present procedure for packaging articles, illustrated by way of an indicative, but not limitative example in the accompanying drawings in which:

Figure 1 is a schematic and partial axonometric view of the machine that realizes the procedure according to the invention;
Figure 2 is a longitudinal sectional view, on enlarged scale, of a detail of the machine of Figure 1;
Figure 3 is a cross sectional view along the track plane III - III of Figure 1;
Figure 4 is a cross sectional view along the track plane IV - IV of Figure 1;
Figure 5 is a cross sectional view along the track plane V - V of Figure 1;
Figure 6 is a side view, on enlarged scale, of a detail of the machine of Figure 1.

Embodiments of the Invention

[0013] With particular reference to the figures, globally indicated by reference numeral 1 is a machine that implements the procedure according to the invention.

[0014] The machine 1 has a base frame, not shown in detail in the figures, carrying a packaging sheet 2 intended for the packaging of a series of articles 3.

[0015] The packaging sheet 2 has a longitudinal extension and two longitudinal edges 4; in practice, the packaging sheet 2 has a length considerably greater than its width, and this allows to define the longitudinal direction of the packaging sheet 2 along which extend the aforesaid longitudinal edges 4.

[0016] The packaging sheet 2 is initially wound in a reel 5 from which it is unrolled, carried on a worktop 6 and made to move along a direction of forward movement

A substantially parallel to its longitudinal extension.

[0017] In the embodiment shown in the illustrations, the direction of forward movement A is substantially horizontal.

[0018] The worktop 6 has side boards 7 which allow to fold the packaging sheet 2 so that the longitudinal edges 4 are slightly raised with respect to the central part of the sheet itself, causing it to take on a shape which, in cross section, is in the form of a U.

[0019] Along the worktop 6 the articles 3 to be packaged are arranged on the packaging sheet 2; for this purpose the machine 1 can have an automatic dispenser that releases the articles 3, but alternatively it is not ruled out that this operation can be carried out manually.

[0020] Two stretching apart bodies 8 are placed downstream of the side boards 7; in this regard it is specified that in the present discussion the word "downstream", as well as the word "upstream", are to be considered with reference to the direction of forward movement A and, therefore:

- when it is stated that a first component of the machine 1 is arranged upstream of a second component, it means that the packaging sheet 2, which moves forward along the direction of forward movement A, first intercepts the first component and then the second one;
- when it is stated that a first portion of the packaging sheet 2 is arranged upstream of a second portion of the packaging sheet 2, it means that the first portion is substantially closer to the reel 5 than the second one.

[0021] The stretching apart bodies 8 are arranged at the longitudinal edges 4, on their inner side.

[0022] Downstream of the stretching apart bodies 8 are provided two moving close bodies 9 that are arranged at the longitudinal edges 4, on their outer side.

[0023] The stretching apart bodies 8 and the moving close bodies 9 mutually cooperate to approach a longitudinal edge 4 to another.

[0024] The stretching apart bodies 8, in fact, are substantially aligned to the side boards 7 and provide that the longitudinal edges 4 remain apart and the packaging sheet 2 maintains the U-shaped conformation until it reaches the stretching apart bodies 8 themselves.

[0025] The moving close bodies 9, on the other hand, are very close to one another and provide that, once the stretching apart bodies 8 are surpassed, the longitudinal edges 4 approach to one another, leaving the central part of the packaging sheet 2 under them.

[0026] The reciprocal approach of the longitudinal edges 4, in practice, leads to the formation of a substantially tubular section 10 of the packaging sheet 2 having an open extremity 11, defined in the proximity of the moving close bodies 9, and the articles 3 inside.

[0027] Between the stretching apart bodies 8 and the moving close bodies 9 is arranged a compressed air duct 12 that blows air through the open extremity 11 of the substantially tubular section 10.

[0028] Downstream of the moving close bodies 9, the machine 1 has a forward moving unit 13, 14, 15 that drives the packaging sheet 2 along the direction of forward movement A.

[0029] The forward moving unit 13, 14, 15 comprises a first conveyor belt 13 on which rests the central part of the packaging sheet 2.

[0030] The forward moving unit 13, 14, 15 also comprises at least a pair of driving rollers 14, 15, which are motorized and arranged on opposite sides of the juxtaposed longitudinal edges 4.

[0031] The driving rollers 14, 15 press on the longitudinal edges 4, by gripping on them and driving them forward along the direction of forward movement A. Conveniently, the forward moving unit 13, 14, 15 comprises two pairs of driving rollers 14, 15, of which a first pair 14 and a second pair 15, arranged in succession above the first conveyor belt 13.

[0032] Between the first pair 14 and the second pair 15 is arranged a sealing unit 16 which seals the longitudinal edges 4 between them forming a sealed longitudinal edge 17.

[0033] Downstream of the forward moving unit 13, 14, 15, the machine 1 is equipped with two opposite rotating members 18, which rotate around rotation axes R parallel to one another and transversal to the direction of forward movement A. In the embodiment shown in the illustrations, the rotation axes R are arranged substantially horizontal, but alternative embodiments cannot be ruled out wherein the rotation axes R are vertical or oblique.

[0034] The opposite rotating members 18 have at least a sealing surface 19, 20 and at least a cutting profile 21 able to come into contact with the substantially tubular section 10 on opposite sides of the same to seal it transversally upstream and downstream of each article 3 to form a plurality of closed packages 22 containing the articles 3 and have a first transversal sealing line 23 and a second transversal sealing line 24.

[0035] More in detail, in the embodiment shown in the illustrations, each opposite rotating member 18 comprises two hammers 26 arranged at 180° with respect to the relative rotation axis R.

[0036] Each hammer 26 has a first sealing surface 19 and a second sealing surface 20, between which is arranged a cutting profile 21.

[0037] In practice, during the forward movement of the substantially tubular section 10 two hammers 26 of the opposite rotating members 18 come simultaneously in contact with the packaging sheet 2, one above the substantially tubular section 10 and one below the substantially tubular section 10.

[0038] In particular, the hammers 26 are in contact with the substantially tubular section 10 first of all at the first sealing surfaces 19, that seal transversally the first transversal sealing line 23 of the closed package 22 arranged immediately downstream of the opposite rotating mem-

bers 18.

[0039] Subsequently, the rotation of the opposite rotating members 18 carries the cutting profiles 21 on the packaging sheet 2, cutting it in the proximity of the first transversal sealing line 23 of the closed package 22 so as to separate it from the rest of the substantially tubular section 10.

[0040] The subsequent rotation of the opposite rotating members 18 carries the second sealing surfaces 20 on the packaging sheet 2, by sealing it transversally at the second transversal sealing line 24 of the packaging sheet 2.

[0041] At the next passage of hammers 26, the substantially tubular section 10, which in the meantime has moved forward between the two opposite rotating members 18, is sealed and cut in a similar way to what described previously, leading to the formation of a new closed package 22.

[0042] Downstream of the opposite rotating members 18 the machine 1 has a moving away unit 28 that collects the closed packages 22 and moves them away; the moving away unit 28, e.g., consists of a second conveyor belt.

[0043] The packaging procedure which can be realized by means of the machine 1 comprises the steps of:

- providing the packaging sheet 2 which, as already mentioned, has a longitudinal extension and two longitudinal edges 4. This step of the procedure consists in unrolling the packaging sheet 2 from the reel 5;
- moving the packaging sheet 2 forward on the worktop 6 along the direction of forward movement A, which is substantially parallel to the longitudinal extension of the packaging sheet 2;
- arranging a plurality of articles 3 to be packaged on the packaging sheet 2 at a reciprocal distance D along the direction of forward movement A. In practice, the articles 3 are placed on the packaging sheet 2 at substantially regular intervals. The reciprocal distance D of the articles 3 on the packaging sheet 2 substantially corresponds to the dimensions of the closed packages 22 in the direction corresponding to the direction of forward movement A;
- moving the longitudinal edges 4 close to each other to form the substantially tubular section 10 of the packaging sheet 2 which, as already said, has the open extremity 11 and the articles 3 inside;
- blowing air in the substantially tubular section 10 through the open extremity 11. In the machine 1 the air is blown through the compressed air duct 12;
- sealing longitudinally the longitudinal edges 4 to one another. This step is performed by the machine 1 by means of the sealing unit 16;
- sealing transversally the substantially tubular section 10 downstream and upstream of each of the articles 3 to form a plurality of closed packages 22 containing the articles 3 and substantially swollen with air. In practice, the air introduced into the substantially tubular section 10 through the open extremity 11 inflates the section itself and keeps it inflated even during the transversal sealing. The closed packages 22 obtained at the end of the procedure, therefore, have two transversal sealing lines 23, 24 and are substantially swollen. Such closed packages 22 allow to package the articles 3 within an air cushion which ensures storage and transport under conditions of great safety for their integrity and which, in the case of "surprise products", prevents the packaging sheet 2 from being crushed so as to touch and recognize the articles 3 without removing the closed packages 22. Usefully, the packaging sheet 2 is made of a heat-sealable material and the steps of sealing longitudinally and sealing transversally occur hot;
- cutting the substantially tubular section 10 to separate the closed packages 22. This step occurs in correspondence to the two transversal sealing lines 23, 24 obtained on the substantially tubular section 10 by means of the sealing transversally. Conveniently, this cutting step occurs at the same time as the sealing transversally. In machine 1, the sealing transversally and the cutting consist in making the substantially tubular section 10 pass between the two opposite rotating members 18, which rotate around the rotation axes R and which have the sealing surfaces 19, 20 and the cutting profiles 21 able to come into contact with the substantially tubular section 10 on opposite sides of same.

Claims

1. Procedure for packaging articles, wherein the articles are not recognizable from its packaging, comprising the steps of:

   - providing a packaging sheet (2) having a longitudinal extension and two longitudinal edges (4);
   - moving said packaging sheet (2) forward along a direction of forward movement (A) substantially parallel to said longitudinal extension;
   - arranging a plurality of articles (3) on said packaging sheet (2) at a reciprocal distance (D) along said direction of forward movement (A);
   - moving said longitudinal edges (4) close to each other to form a substantially tubular section (10) of said packaging sheet (2) having an open extremity (1 1) and said articles (3) inside;
   - blowing air in said substantially tubular section (10) through said open extremity (11);
   - sealing said longitudinal edges (4) together longitudinally;
   - sealing transversally said substantially tubular section (10) downstream and upstream of each of said articles (3) to form a plurality of closed packages (22) containing said articles (3) and

substantially swollen with air so as to avoid that potential buyers can recognize the article (3) without removing the package (22).

2. Procedure according to the claim 1, further comprising the step of cutting said substantially tubular section (10) to separate said closed packages (22).

3. Procedure according to the claim 2, wherein said cutting occurs in correspondence to two transversal sealing lines (23, 24) obtained on said substantially tubular section (10) by means of said sealing transversally.

4. Procedure according to claim the 3, wherein said cutting occurs at the same time as said sealing transversally.

5. Procedure according to any of claims 2-4, wherein said sealing transversally and said cutting comprise making said substantially tubular section (10) pass between two opposite rotating members (18), which rotate around rotation axes (R) which are parallel to one another and transversal to said direction of forward movement (A) and which have at least a sealing surface (19, 20) and a cutting profile (21) able to contact said substantially tubular section (10) on opposite sides of same.

6. Procedure according to one or more of the preceding claims, wherein said step of providing a packaging sheet comprises unrolling said packaging sheet (2) from a reel (5).

7. Procedure according to one or more of the preceding claims, wherein said reciprocal distance (D) of the articles (3) substantially corresponds to the dimensions of said closed packages (22) along said direction of forward movement (A).

8. Procedure according to one or more of the preceding claims, wherein said packaging sheet (2) is heat-sealable and said sealing longitudinally and said sealing transversally are hot.

Patentansprüche

1. Verfahren zum Verpacken von Gegenständen, wobei die Gegenstände durch ihre Verpackung nicht erkennbar sind, umfassend die Schritte:

- Bereitstellen einer Verpackungsfolie (2) aufweisend eine Längsausdehnung und zwei Längskanten (4);
- Vorwärtsbewegen der Verpackungsfolie (2) entlang einer Richtung in Vorwärtsbewegung (A) im Wesentlichen parallel zu der genannten Längsausdehnung;
- Anordnen einer Vielzahl von Gegenständen (3) auf der genannten Verpackungsfolie (2) in einem reziproken Abstand (D) entlang der genannten Richtung in Vorwärtsbewegung (A);
- Bewegen der genannten Längskanten (4) nahe zueinander, um einen im Wesentlichen rohrförmigen Abschnitt (10) der genannten Verpackungsfolie (2) zu bilden, der ein offenes Ende (11) und die genannten Gegenstände (3) im Inneren aufweist;
- Blasen von Luft in den genannten im Wesentlichen rohrförmigen Abschnitt (10) durch das genannte offene Ende (11);
- Longitudinales Versiegeln der genannten Längskanten (4) miteinander;
- Transversales Versiegeln des genannten im Wesentlichen rohrförmigen Abschnitts (10) stromabwärts und stromaufwärts von jedem der genannten Gegenstände (3), um eine Vielzahl von geschlossenen Verpackungen (22) zu bilden, die die genannten Gegenstände (3) enthalten und im Wesentlichen mit Luft aufgequollen sind, um zu vermeiden, dass potentielle Käufer den Gegenstand (3) erkennen können, ohne die Verpackung (22) zu entfernen.

2. Verfahren nach dem Anspruch 1, ferner umfassend den Schritt Schneiden des genannten im Wesentlichen rohrförmigen Abschnitts (10), um die genannten geschlossenen Verpackungen (22) zu trennen.

3. Verfahren nach dem Anspruch 2, wobei das genannte Schneiden in Übereinstimmung mit zwei transversalen Siegellinien (23, 24) erfolgt, die auf dem genannten im Wesentlichen rohrförmigen Abschnitt (10) mittels des genannten transversalen Versiegelns erzeugt wurden.

4. Verfahren nach dem Anspruch 3, wobei das genannte Schneiden zur gleichen Zeit wie das genannte transversale Versiegeln erfolgt.

5. Verfahren nach einem der Ansprüche 2-4, wobei das genannte transversale Versiegeln und das genannte Schneiden umfassen, dass der genannte im Wesentlichen rohrförmige Abschnitt (10) zwischen zwei sich gegenüberliegenden rotierenden Elementen (18) hindurchläuft, die um Drehachsen (R) rotieren, die parallel zueinander und transversal zu der genannten Richtung in Vorwärtsbewegung (A) sind und die mindestens eine Siegelfläche (19, 20) und ein Schneideprofil (21) aufweisen, welche in der Lage sind, den im Wesentlichen rohrförmigen Abschnitt (10) an gegenüberliegenden Seiten desselben zu kontaktieren.

6. Verfahren nach einem oder mehreren der vorherge-

henden Ansprüche, wobei der genannte Schritt des Bereitstellens einer Verpackungsfolie das Abwickeln der genannten Verpackungsfolie (2) von einer Rolle (5) umfasst.

7. Verfahren nach einem oder mehreren der vorhergehenden Ansprüche, wobei der genannte reziproke Abstand (D) der Gegenstände (3) im Wesentlichen den Dimensionen der genannten geschlossenen Verpackungen (22) entlang der genannten Richtung in Vorwärtsbewegung (A) entspricht.

8. Verfahren nach einem oder mehreren der vorhergehenden Ansprüche, wobei die genannte Verpackungsfolie (2) heißsiegelbarbar ist und das genannte longitudinale Versiegeln und das genannte transversale Versiegeln heiß erfolgen.

Revendications

1. Procédé d'emballage d'articles, dans lequel les articles ne sont pas reconnaissables à partir de leurs emballages, comprenant les étapes consistant à:

- fournir une feuille d'emballage (2) ayant une extension longitudinale et deux bords longitudinaux (4) ;
- déplacer ladite feuille d'emballage (2) vers l'avant selon une direction de déplacement vers l'avant (A) substantiellement parallèle à ladite extension longitudinale ;
- agencer une pluralité d'articles (3) sur ladite feuille d'emballage (2) à une distance (D) réciproque le long de ladite direction de déplacement vers l'avant (A) ;
- déplacer lesdits bords longitudinaux (4) de manière à rapprocher l'un de l'autre pour former une section substantiellement tubulaire (10) de ladite feuille d'emballage (2) ayant une extrémité ouverte (11) et lesdits articles (3) à l'intérieur ;
- souffler de l'air dans ladite section essentiellement tubulaire (10) à travers ladite extrémité ouverte (11) ;
- sceller lesdits bords longitudinaux (4) ensemble longitudinalement ;
- sceller transversalement ladite section essentiellement tubulaire (10) en aval et en amont de chacun desdits articles (3) pour former une pluralité d'emballages fermés (22) contenant lesdits articles (3) et substantiellement gonflés d'air de manière à éviter que les acheteurs potentiels puissent reconnaître l'article (3) sans retirer l'emballage (22).

2. Procédé selon la revendication 1, comprenant en outre l'étape consistant à découper ladite section essentiellement tubulaire (10) pour séparer lesdits emballages fermés (22).

3. Procédé selon la revendication 2, dans lequel ladite découpe se produit en correspondance avec deux lignes de scellement transversal (23, 24) obtenues sur ladite section essentiellement tubulaire (10) au moyen dudit scellement transversal.

4. Procédé selon la revendication 3, dans lequel ladite découpe est réalisée en même temps que ledit scellement transversal.

5. Procédé selon l'une des revendications 2 à 4, dans lequel ledit scellement transversal et ladite découpe comprennent le fait de faire passer ladite section essentiellement tubulaire (10) entre deux éléments rotatifs opposés (18) qui tournent autour des axes de rotation (R) qui sont parallèles l'un à l'autre et transversaux par rapport à ladite direction de déplacement vers l'avant (A) et qui présentent au moins une surface de scellement (19, 20) et un profil de découpe (21) pouvant entrer en contact avec ladite section essentiellement tubulaire (10) sur des côtés opposés de celle-ci.

6. Procédé selon l'une ou plusieurs des revendications précédentes, dans lequel ladite étape consistant à fournir une feuille d'emballage comprend le déroulement de ladite feuille d'emballage (2) à partir d'une bobine (5).

7. Procédé selon l'une ou plusieurs des revendications précédentes, dans lequel ladite distance réciproque (D) des articles (3) correspond substantiellement aux dimensions desdits emballages fermés (22) le long de ladite direction de déplacement vers l'avant (A).

8. Procédé selon l'une ou plusieurs des revendications précédentes, dans lequel ladite feuille d'emballage (2) est thermoscellable et ledit scellement longitudinal et ledit scellement transversal se produisent à chaud.

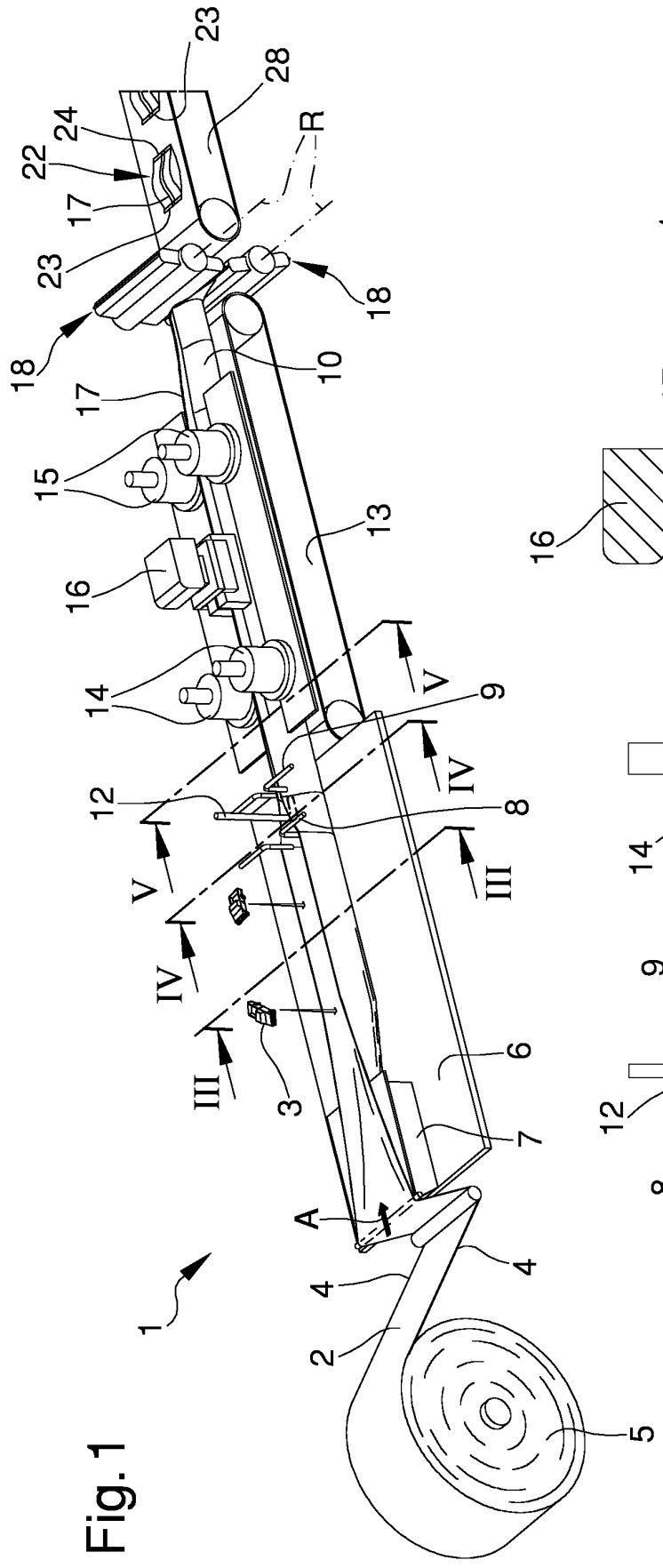

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Fig. 1

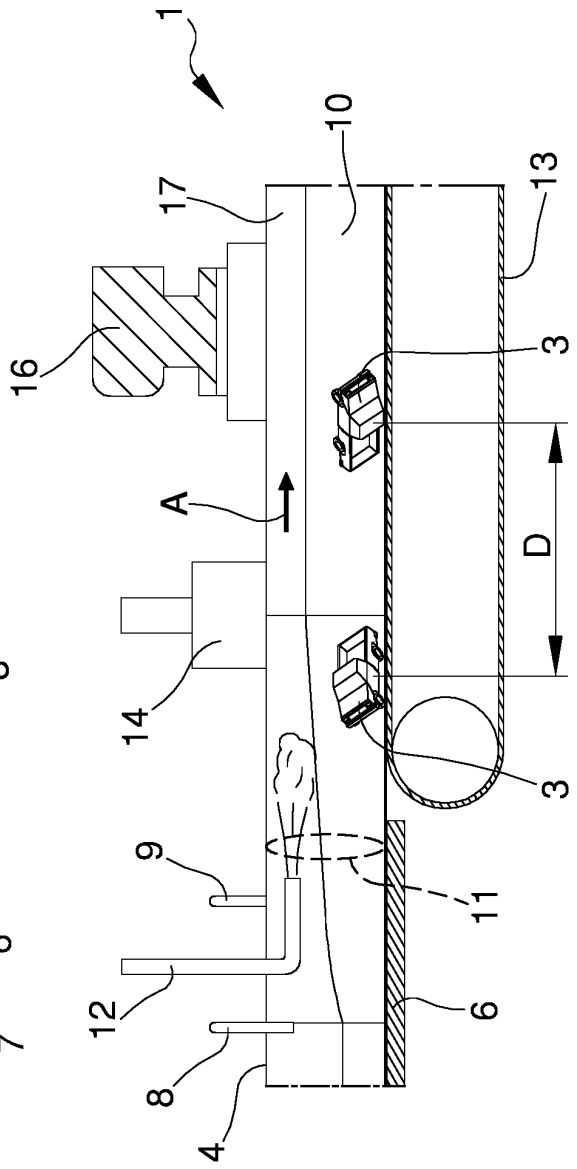

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Fig. 2

Fig. 3

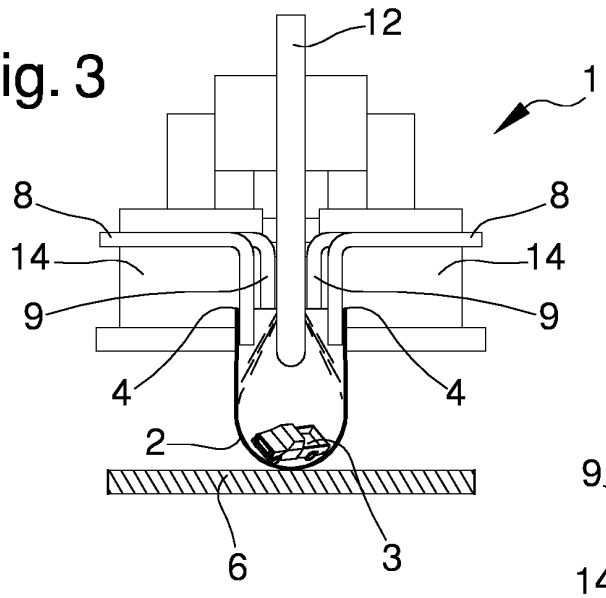


Fig. 4

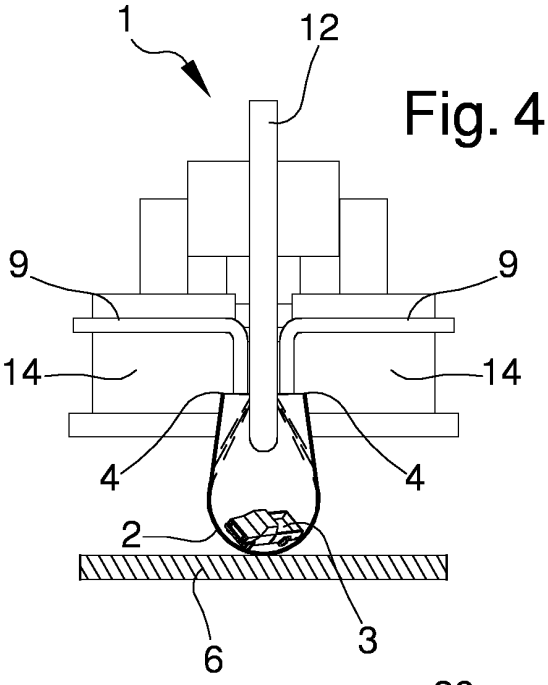


Fig. 5

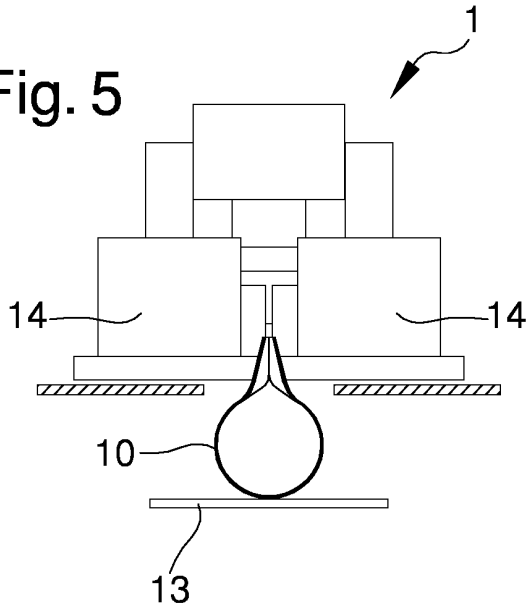
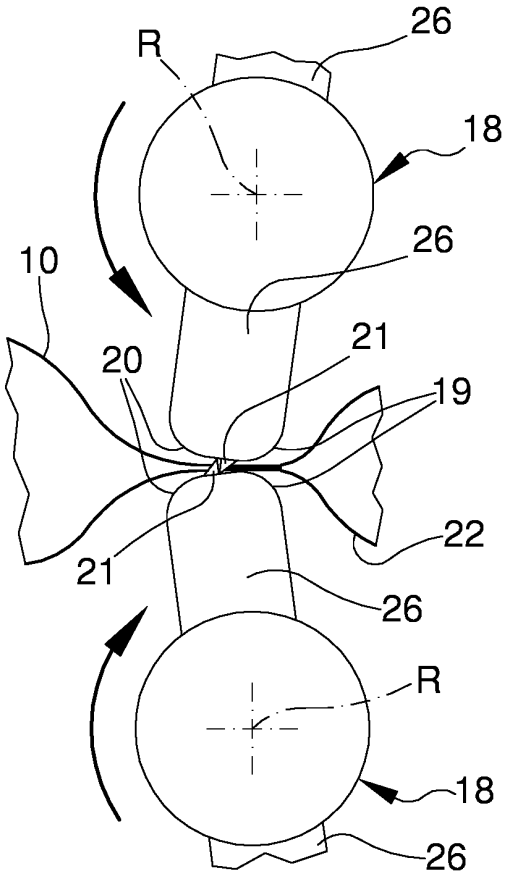


Fig. 6



REFERENCES CITED IN THE DESCRIPTION

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