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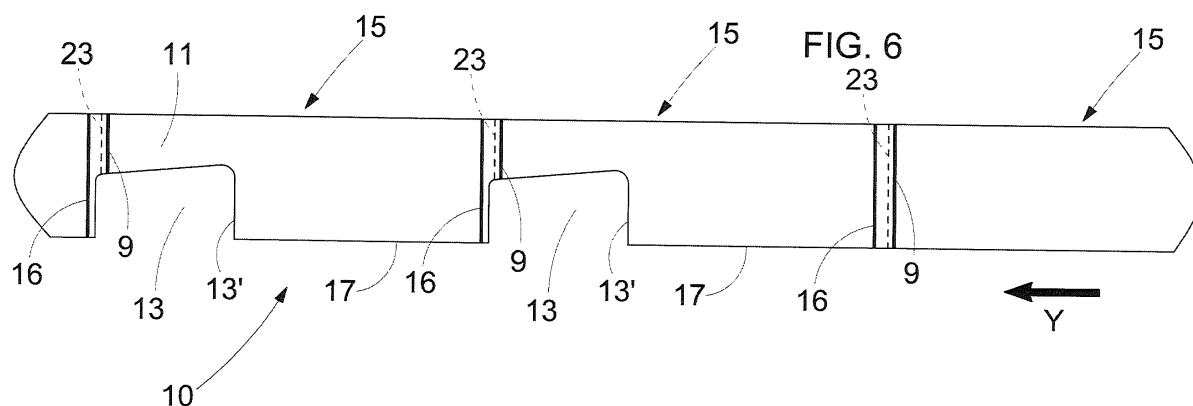
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(54) **METHOD FOR THE MANUFACTURE OF ROLLS OF PRE-CUT BAGS WITH PUNCHED HANDLES**

(57) A method for the manufacture of rolls of pre-cut bags with punched handles, of the type with "star" or "tomato" base, comprising the steps of: sliding movement of a tubular film (10) in plastic material, formation of two opposite gussets (12, 14) along side edges of said tubular film, single folding of said tubular film (10) gusseted along a median longitudinal axis (17), insertion of a layer of Teflon (38) between said gussets (12, 14) of the single-folded tubular film (10) with function of insulant to prevent that the first gusset (12) and the second gusset (14) can weld one to the other, formation of a transverse precutting line (23) apt to define a line of separation between single bags (15) of said tubular film, formation of a transverse

welding line (16) at a base of the single bag (15) and of a transverse welding line (9) at handles (11) of the adjacent bag (15), punching of the single-folded tubular film (10) to define handles (11) of the bags (15), winding of said tubular film to form a roll of bags (15) and wherein the steps of performance of the transverse pre-cut (23), welding (16) of the base and welding (9) of the handles (11) of the single bags (15) are carried out in a simultaneous way with the transverse welding (16) of the base of a bag (15) performed downstream of the transverse welding (9) of the handles of the successive and adjacent bag.



Description

[0001] The present invention relates to a method for the manufacture of rolls of pre-cut bags with punched handles

[0002] More particularly the present invention relates to a method for the manufacture of rolls of pre-cut bags of the shopper type and with punched handles, especially of the type with base of the so-called "star" or "tomato" type typically, but not exclusively, used in supermarkets for the insertion and subsequent weighing of fruit, vegetables and similar foods sold loose or non-pre-packaged.

[0003] As is known, the bags of the shopper type, or also called "T-shirt" (see for example the standard UNI 8055:2011), can be of the "extended" or "flat" type or with a "star" or "tomato" base. Said latter types tend increasingly often to replace the bags of the "flat" type in that they have the advantage of solving the disadvantage of the typical fragility of the "flat" bags at the point in which the gusset ends and the bag, as is known, passes from four to two thicknesses of plastic film.

[0004] The bags or shoppers with "star" or "tomato" base are typically and traditionally made from a tubular film 10 in plastic material or the like (Figure 1) which is completely gusseted along the side edges to define two opposite gussets 12 and 14 with longitudinal development (Figure 2), single folded (Figure 3) with a special folding device along a median longitudinal axis 17 and, subsequently, subjected to an operation of transverse welding to weld handles 11 and a base of each bag 15 (Figure 5).

[0005] The welding of the handles 11 is performed using a band or strip of Teflon which, interposed in the gusset, more specifically between the gusset 12 and the gusset 14 of Figure 3 formed following single folding of the tubular film, allows the welding of the gussets preventing the handles also from being welded one to the other. More particularly said strip or band of Teflon separates the two handles of the bag, allowing an upper welding device to weld a handle or grip and a lower welding device to weld the other handle, preventing said two handles from being welded one to the other (as schematised in Figures 4 and 5 by the welding line 9).

[0006] Subsequent to the welding of the handles or grips the welding of the base 16 of the bag 15 is performed with the gusset 12 and the gusset 14 which are welded one to the other conferring, in this way, the characteristic of the "star" or "tomato" base with all eight thicknesses of plastic film which are welded one to the other guaranteeing high resistance for the base (Figure 5).

[0007] The handles 11, as is known, are obtained through punching performed before or after the welding of the base. This punching (in Figure 4 the portion defining the shape of the bag is denoted by 13) can, likewise, be obtained by means of a pre-cut with subsequent removal of the scrap after the welding of the base of the bag.

[0008] The system or apparatus which makes the strip or band of welded bags imposes on said band a direction

of forward movement as indicated by the arrow X in Figure 4. This working situation entails a disadvantage linked to the fact that a simultaneous welding of the base and of the handles of the bag is not possible in that the interposition of the strip of Teflon between the welding devices of the handles interferes with the forward movement of the welding of the base of the bag.

[0009] Finally the methods currently used for the production of shopper bags with "star" or "tomato" base, using flat or rotary machines, perform the welding of the handles and of the base of the bag in two successive stations and, in any case, provide for the extraction or the non-presence of the strip of Teflon when the base is welded. This entails a structural complication of the machine and the need to carry out laborious operations of regulation at each change of format of the bags to be produced.

[0010] WO 2010/108944 describes such a method for the production of shopper bags with "star" or "tomato" base and therefore has the disadvantages stated previously.

[0011] The object of the present invention is that of obviating the disadvantages stated above. More particularly the object of the present invention is that of providing a method for the manufacture of rolls of pre-cut bags with punched handles apt to perform the welding of the handles and of the base of the bag in a single phase without the need for double movements.

[0012] A further object of the present invention is that of providing a method which does not need regulation of the distance between the welding bars as the length of the bag to be manufactured varies.

[0013] A further object of the present invention is to make available to users a method for the manufacture of bags apt to ensure a high level of resistance and reliability in time of the product obtained and such, moreover, as to be easily and economically produced.

[0014] These and other objects are achieved by the system of the invention that has the features of claim 1.

[0015] According to the invention a method is provided for the manufacture of a roll of pre-cut bags with punched handles, of the type with "star" or "tomato" base, comprising the steps of sliding movement of a tubular film in plastic material, formation of two opposite gussets along side edges of said tubular film, single folding of said gusseted tubular film along a median longitudinal axis, insertion of a layer of Teflon between said gussets of the single-folded tubular film with function of insulant to prevent the first gusset and the second gusset from being able to weld to each other, formation of a line of transverse pre-cutting apt to define a line of separation between single bags of said tubular film, formation of a transverse welding band at a base of the single bag and of a transverse welding band at handles of the adjacent bag, punching of the single-folded tubular film to define handles of the bags, winding of said tubular film to form a roll of bags, with the steps of formation of the transverse pre-cut, welding of the base and welding of the handles

of the single bags performed simultaneously to the transverse welding of the base of a bag formed downstream of the transverse welding of the handles of the successive and adjacent bag.

[0016] In this description the terms "upstream" and "downstream" are referred to the direction of forward movement of the film, understanding "downstream" to be an operation which takes place in a more advanced position with respect to another in the direction of forward movement of the film.

[0017] Advantageous embodiments of the invention are disclosed by the dependent claims.

[0018] The constructional and functional features of the method for the manufacture of rolls of pre-cut bags with punched handles of the present invention will be made clearer by the following detailed description, in which reference is made to the accompanying drawings which represent a preferred and non-limiting embodiment thereof and in which:

Figures 1, 2 and 3 represent schematically three successive working phases for the manufacture of a bag with "star" or "tomato" base, with said steps preparatory to the successive phases of welding and punching;

Figure 4 represents schematically a strip or band of bags made according to a prior art;

Figure 5 represents schematically a finished bag cut from the strip or band as per Figure 4;

Figure 6 represents schematically a strip or band of bags made in accordance with the method of the invention;

Figure 7 shows schematically a plan view from above of a welding device of an apparatus for the manufacture of pre-cut bags according to the method of the invention;

Figure 8 represents schematically a front view in cross section of the welding device as per the previous drawing;

Figures 9, 10, 11 represent schematically alternative embodiments of the punching of handles formed in accordance with the method of the invention.

[0019] Referring to the aforementioned drawings, the method for the manufacture of rolls of pre-cut bags with punched handles comprises a sequence of steps of processing performed on a tubular film 10 which is made to move forwards in the direction indicated by the arrow Y in Figure 6 with the handles or grips 11 of the single bags 15 positioned at the head with respect to the bases (substantially with said punchings or regions of the grips/handles in an opposite position with respect to the traditionally known arrangement).

[0020] The method for the manufacture of bags in accordance with the present invention is applied to a welding apparatus for the production of rolls of pre-cut bags with punched handles, already the subject of description in the Italian patent no. 0001394527 of the same Appli-

cant and, therefore, not described in detail.

[0021] Said automatic apparatus, represented only partially in the drawings, is fed continuously by at least one tubular film 10 which is gusseted and single-folded in longitudinal direction according to traditionally known methods to define a strip which is made to transit in a welding and pre-cutting station 18 (described in detail here below) having the function of welding the handles and the base of the bags and in a punching station having the function of obtaining the handles 11 of the aforementioned bags, with said punching station which can be positioned upstream or downstream of the welding and pre-cutting station.

[0022] This known apparatus is, likewise, provided with means for stopping the tubular film 10, having the function of stopping the sliding of a portion of said film at least with respect to the welding and pre-cutting station 18 in such a way as to be able to perform the operations of welding and, optionally, also those of punching in an optimal way, that is to say with the tubular film practically at a standstill, without stopping the feeding of the same.

[0023] With particular reference to Figures 7 and 8 the welding and pre-cutting station 18 is schematised which comprises two opposite welding bars, an upper welding bar 20 and a lower welding bar 22, placed transversely to the tubular film 10, which can be moved reciprocally towards/away with respect to the tubular film 10 slidably placed between said opposite welding bars. According to a preferred embodiment the upper welding bar is mobile while the lower one is fixed or, alternatively, the upper welding bar is fixed while the lower welding bar is mobile or, again, both the welding bars are mounted mobile. The upper welding bar 20 and the lower welding bar 22 each comprise a film blocking element, respectively, upper 24 and lower 26, tendentially U-shaped and co-operating one with the other to block the tubular film during the phase of welding and pre-cutting.

[0024] The upper film blocking element 24 of the upper welding bar 20 houses a pre-cutting blade 28 having the function of forming a pre-cut 23 in transverse direction of the tubular film 10 during the phase of welding. This transverse pre-cut defines substantially a line of separation between the bags 15 of the tubular film 10 apt to facilitate the separation between the same for use.

[0025] The lower film blocking element 26, on the opposite side with respect to the tubular film 10, co-operates with a series of contrast springs 30 for the function described here below.

[0026] The upper welding bar 20 and the lower welding bar 22 comprise, respectively, a pair of upper welding resistors 32 and 32' and a pair of lower welding resistors 34 and 34' parallel and opposite one to the other and apt to come into contact with the upper and lower surface of the tubular film to perform the welding of the same.

[0027] More particularly the upper 32 and lower 34 welding resistors have the function of forming a transverse welding line 16 at the base of the single bags, while the upper 32' and lower 34' welding resistors have the

function of forming a further transverse welding line 9 of the handles 11 of the same bags 15.

[0028] Moreover the upper 32 and lower 34 welding resistors for the welding of the base of the bag 15, considering the direction Y of forward movement of the tubular tape 10, are placed upstream of the upper 32' and lower 34' welding resistors for the welding of the handles of said same bag.

[0029] The upper 32' and lower 34' welding resistors are provided with at least one strip 36 in Teflon placed between said welding resistors and the upper 20 and lower 22 welding bars with function of insulant (one strip in Teflon attached to the upper welding bar and placed between the upper welding bar and the upper welding resistors and a similar strip in Teflon fixed between the lower welding bar and the lower welding resistors).

[0030] The upper welding resistors 32, 32' and the lower welding resistors 34, 34' are likewise provided with a further strip 36' likewise in Teflon, placed between the upper welding resistors 32, 32' and an upper layer of the tubular film 10 and between the lower welding resistors 34, 34' and a lower layer of the same tubular film, with said strips of Teflon having the function of protecting said welding resistors and preventing the material to be welded from adhering to the same resistors.

A layer of Teflon 38 is likewise placed inside the tubular film 10 and, more particularly, inserted between the first gusset 12 and the second gusset 14 of said single-folded tubular film as described above and as schematised in Figure 3.

[0031] Referring to Figure 7, said layer of Teflon 38 is restrained, placed on a plane parallel to that of the tubular film 10, to an attachment rod 40 placed at the upper and lower welding bars and attached to the welding and pre-cutting station 18 so as to maintain said layer of Teflon 38 between said first gusset and said second gusset of the tubular film 10.

[0032] The layer of Teflon 38 is inserted between the first gusset 12 and the second gusset 14 of the single-folded tubular film 10 at the upper welding resistor 32' and the lower welding resistor 34', i.e. at the zone intended for the transverse welding 9 of the handles 11. In this way the layer of Teflon 38 performs an insulating function apt to prevent the first gusset 12 and the second gusset 14 from welding one to the other.

[0033] Moreover said layer of Teflon (38) remains placed between the first gusset (12) and the second gusset (14) throughout the duration of the cycle of sliding of the single-folded tubular film at the welding and pre-cutting station 18.

[0034] Bearing in mind the fact that the overall thickness of the layers of Teflon 36, 36' and 38 at the zone intended for the transverse welding 9 of the handles 11 of the bags 15 is greater than the thickness in the zone intended for the transverse welding 16 of the base of the same bags, due to the presence of the layer of Teflon 38, at said latter zone and, more particularly, between the upper and lower welding bars and the respective

welding resistors, a spacer element 42 in Teflon is attached having the function of compensating the difference in thickness of the layers in Teflon as defined above.

[0035] The station of punching of the bags 15 (not shown in the drawings) is placed downstream of the welding and pre-cutting station 18 with the punch placed at a distance corresponding to the length of the bag to be manufactured or, alternatively, upstream of said station of welding and pre-cutting.

[0036] Moreover this punching can be performed with a total (Figure 9) or partial (Figure 10) removal of material of the tubular tape 10 or, likewise, with pre-cutting of the same tubular tape (Figure 11). The dimension of the punching corresponds to the dimension of the handles which are intended to be formed.

[0037] In the case of punching with total removal of material a portion of punching 13 is defined with shape and length corresponding to the type of handles which are intended to be manufactured and, taking account of the direction of forward movement of the tubular tape 10, said portion of punching 13 has a mouth 13' turned at the base of the bag 15 and the direction of forward movement of the tubular tape 10 with the consequence that an entry of air may occur in the bag 15 during the forward movement of the tubular tape.

[0038] In order to prevent this undesirable phenomenon, the tubular film 10 is charged with electrostatic charges of opposite sign on the two surfaces of the film in such a way that, due to the effect of the electrical attraction, said surfaces remain electrostatically adhered. Referring to Figure 9, in which the configuration wherein the punching is performed for total removal of the scrap is schematised, at the mouth 13' of the portion of punching 13 a turn or fold 43 is formed, created by means of a folding of a flap of the mouth of the punching at a corner and turned in the direction of the base of the bag.

The turn or fold 43 is formed due to the effect of the speed of forward movement of the tubular film and co-operates with the electrostatic action in order to close the mouth 13' with respect to the entry of air in the bags.

[0039] The apparatus for the production of bags is traditionally provided with an extractor hood (not shown in the drawings) having the function of aspirating the punching scrap and whose flow of air, during the sliding of the tubular film 10, sucks in a flap of punching 13 which, by folding, defines the turn or fold 43 preventing, in this way, accidental entry of air in the bag 15.

[0040] In an alternative embodiment schematised in Figure 10 a partial punching of the tubular film 10 is performed with removal of the scrap at each bag 15 and defined by a punching window 44 closed at the edge of folding of the tubular film 10 by a flap 46 of film provided with lines of transverse pre-cutting in such a way as to allow easy removal thereof in a successive phase. This embodiment avoids the formation of the turn or fold 43 which is present in the case of punching for total removal of the scrap described previously.

[0041] Figure 11 shows schematically a further alter-

native embodiment for the punching defining the handles 11, which does not comprise total or partial removal of scrap, but instead a pre-cut 48 apt to be removed in a successive phase for the forming of the handles 11 of the bag 15 (for example before the station of rolling or when a single bag is detached from the rolled tubular tape 10).

[0042] The bags 15 formed in this way (welded and pre-cut) on the tubular tape 10 are wound around an axis of winding at a rolling station to define rolls of bags conveyed, subsequently, to an unloading station.

As can be seen from the above the advantages that the apparatus of the invention achieves are clear.

[0043] The method for the manufacture of rolls of pre-cut bags with punched handles of the present invention allows advantageously the welding of the handles and of the base of the bag to be performed in a single step without the need for double movements and without the need to regulate the distance between the welding bars as the length of the bags to be produced varies. In fact the direction of forward movement of the tubular tape allows the welding of the handles of a bag to be performed upstream of that of the base of the preceding bag without the need to have to continuously extract and insert the layer of Teflon 38 between the first gusset 12 and the second gusset 14 of the tubular film 10.

[0044] Although the invention has been described above with particular reference to one of its embodiments given solely by way of a non-limiting example, numerous changes and variations will appear clear to a person skilled in the art in light of the description given above. The present invention intends, therefore, to embrace all the modifications and the variations that fall within the scope of the following claims.

Claims

1. A method for the manufacture of rolls of pre-cut bags with punched handles, of the type with "star" or "tomato" base comprising the steps of:

- sliding movement of a tubular film (10) in plastic material;
- formation of two opposite gussets (12, 14) along side edges of said tubular film;
- single folding of said tubular film (10) gusseted along a median longitudinal axis (17);
- insertion of a layer of Teflon (38) between said gussets (12, 14) of the single-folded tubular film (10) with function of insulant to prevent that the first gusset (12) and the second gusset (14) can weld one to the other;
- formation of a transverse pre-cutting line (23) apt to define a line of separation between single bags (15) of said tubular film;
- formation of a transverse welding line (16) at a base of the single bag (15) and of a transverse

welding band (9) at handles (11) of the adjacent bag (15);

- punching of the single-folded tubular film (10) to define handles (11) of the bags (15);
- winding of said tubular film to form a roll of bags (15);

characterised in that the steps of formation of the transverse pre-cut (23), welding (16) of the base and welding (9) of the handles (11) of the single bags (15) are carried out in a simultaneous way with the transverse welding (16) of the base of a bag (15) performed downstream of the transverse welding (9) of the handles of the successive and adjacent bag, and **in that** said layer of Teflon (38) remains inserted between the first gusset (12) and the second gusset (14) of the single-folded tubular film (10) during the entire cycle of sliding of said tubular film at the welding and pre-cutting station (18).

2. Method according to claim 1, **characterised in that** the sliding of the tubular film (10) takes place with the handles (11) of the bags (15) oriented at the head with respect to the base of the same bags.
3. Method according to claim 1 or 2, **characterised in that** the steps of insertion of the layer of Teflon (38), transverse pre-cutting, transverse welding of the handles (11) of a bag (15) and transverse welding of the base of an adjacent and successive bag (15) are performed in a single welding and pre-cutting station (18).
4. Method according to any one of the preceding claims, **characterised in that** the step of punching takes place through total removal of material of the tubular layer to define a portion of punching (13) open at the longitudinal edge of single folding of the tubular tape (10).
5. Method according to any one of claims 1 to 3, **characterised in that** the step of punching takes place through partial removal of material of the tubular tape (10) to define a window of punching (44) closed at the longitudinal edge of single folding of the tubular tape.
6. Method according to any one of claims 1 to 3, **characterised in that** the punching of the handles (11) of the bags (15) is defined by a pre-cut (48) of the tubular tape (10).
7. Method according to claim 6, **characterised in that** it comprises a step of removal of the scrap of punching performed after the step of punching close to the step of winding.
8. Method according to claim 4, **characterised in that**

it comprises a step of forming of a turn or fold (43) of the portion of punching (13) by means of a folding of a flap of the portion of punching (13) at one corner of the portion of punching at the longitudinal axis of single folding of the tubular tape (10) and turned in the direction of the base of the bag (15), with said turn or fold (43) co-operating with electrostatic charges of opposite sign on the two surfaces of said tubular film to prevent an entry of air in the bags (15) of the tubular tape (10).

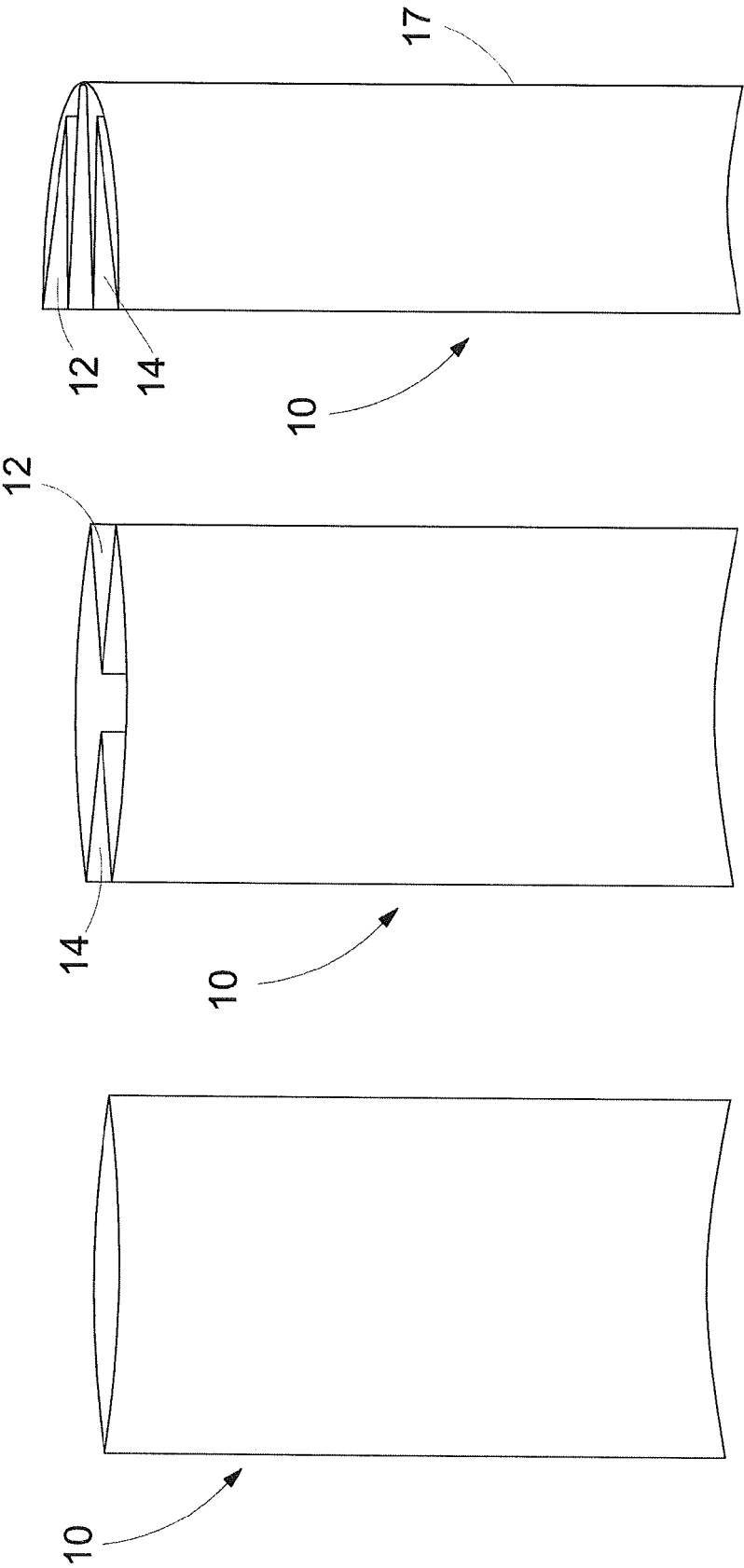
9. Apparatus for the manufacture of rolls of pre-cut bags and with punched handles according to the method in accordance with any one of the preceding claims, comprising means for the sliding movement of a tubular film (10) in plastic material, means for the formation of two opposite gussets (12, 14) along side edges of said tubular film and means for forming a single folding of the tubular film (10) gusseted along a median longitudinal axis (17), a station of welding and pre-cutting (18) which comprises means for the insertion and the maintaining of a layer of Teflon (38) between the gussets (12, 14) of the single-folded tubular film (10) during the entire cycle of sliding of said tubular film at the station of welding and pre-cutting, means for forming a transverse pre-cut (23) defining a line of separation between single bags (15) of the tubular film (10) and means for forming, simultaneously to said transverse pre-cut, a transverse welding line (16) at a base of the single bag (15) and a transverse welding line (9) upstream of the transverse welding (16) and at handles (11) of the adjacent and successive bag (15), apparatus which further comprises a station of punching of the single-folded tubular film (10) and a station of winding of said tubular film to form a roll of bags (15).

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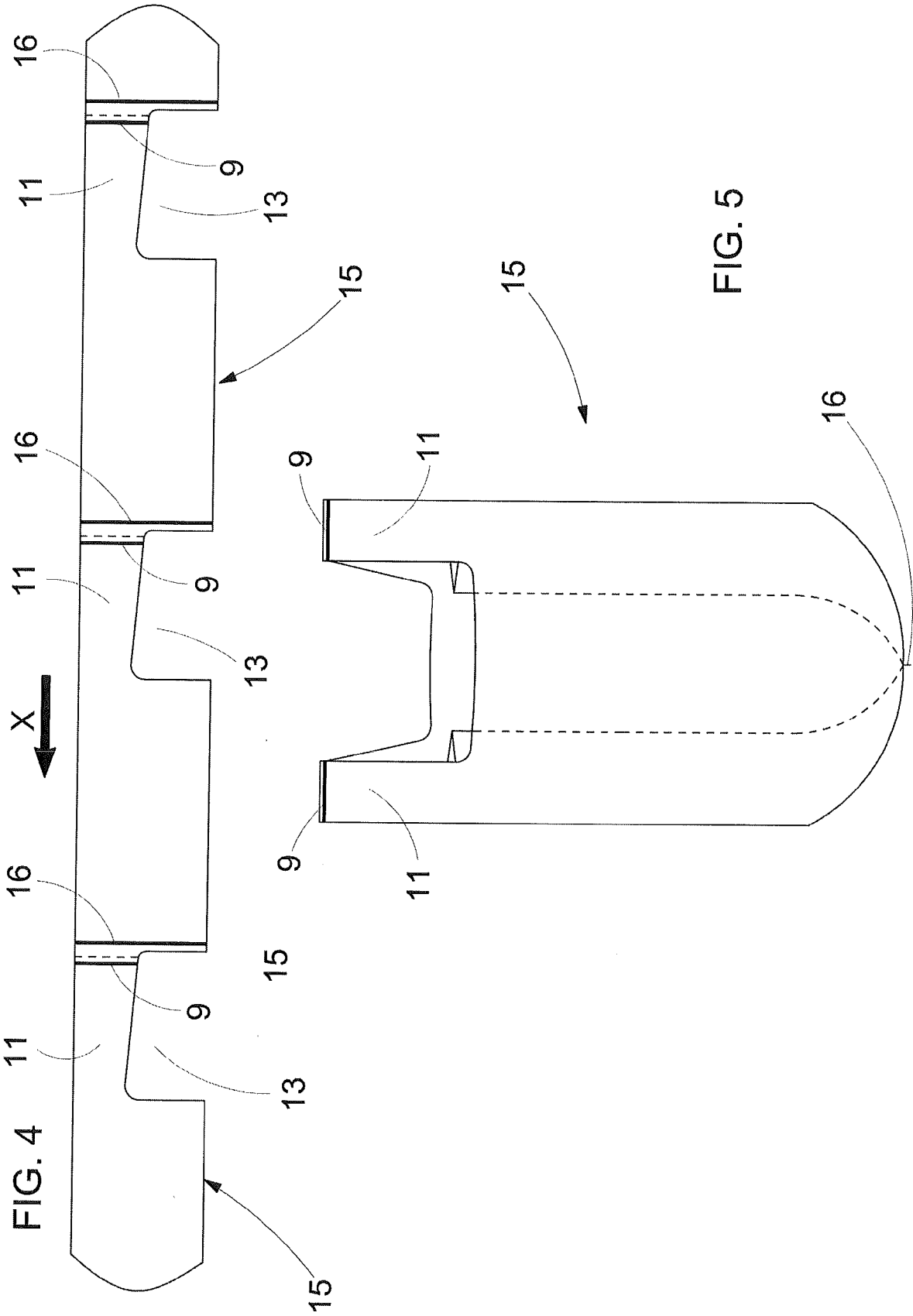
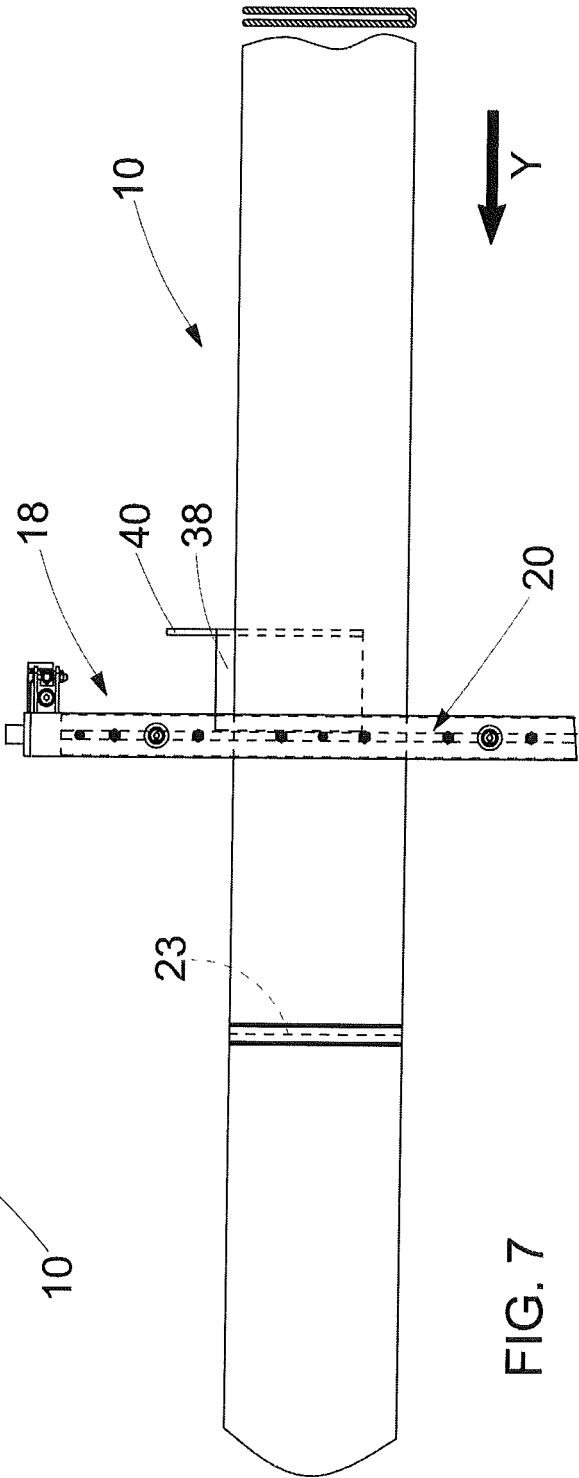
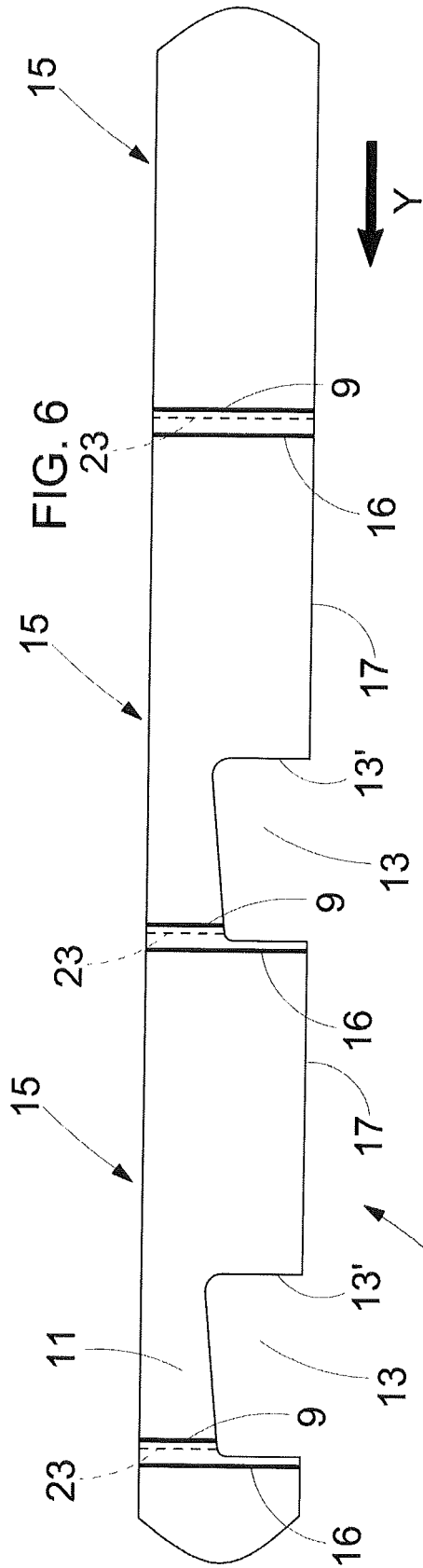


FIG. 5



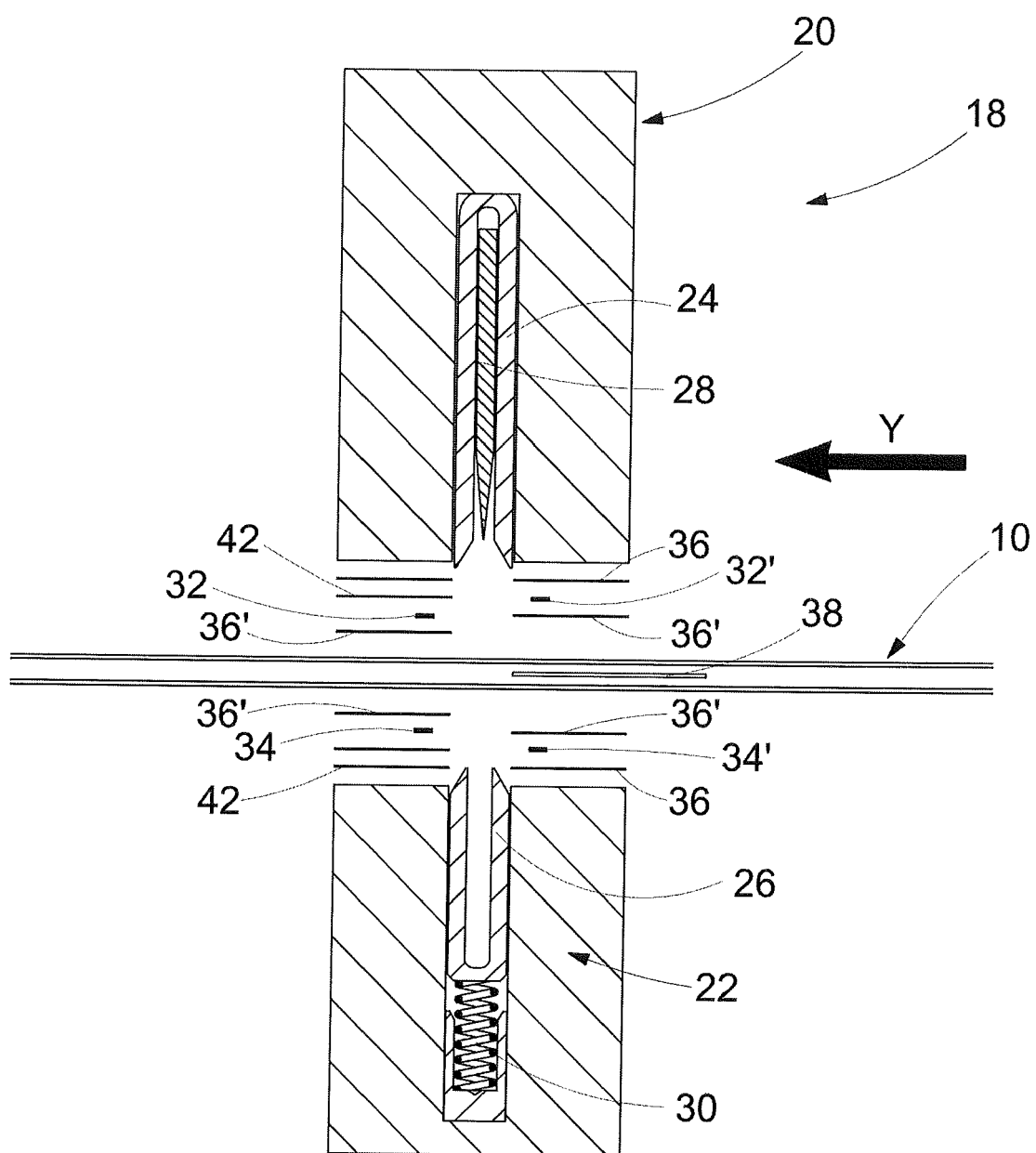
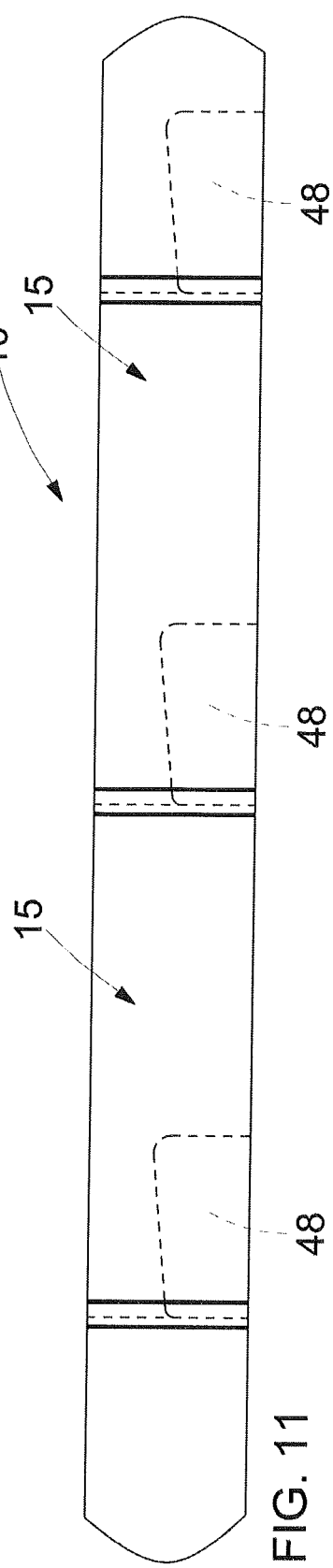
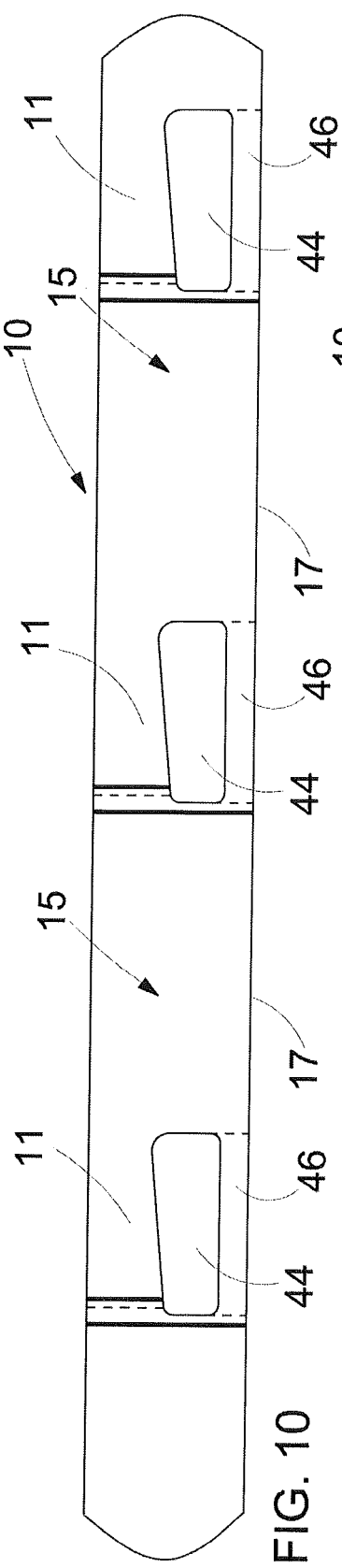
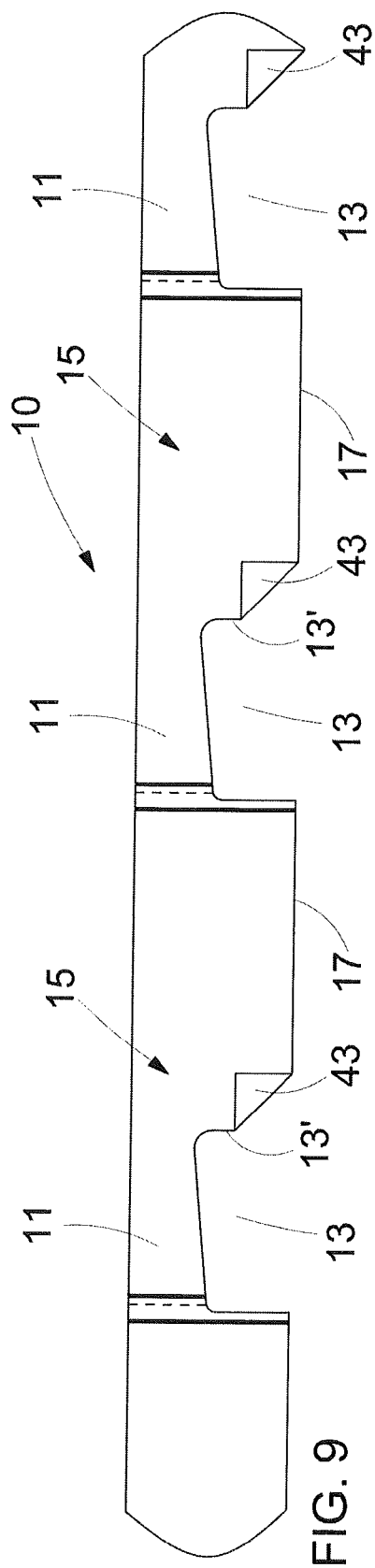


FIG. 8



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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