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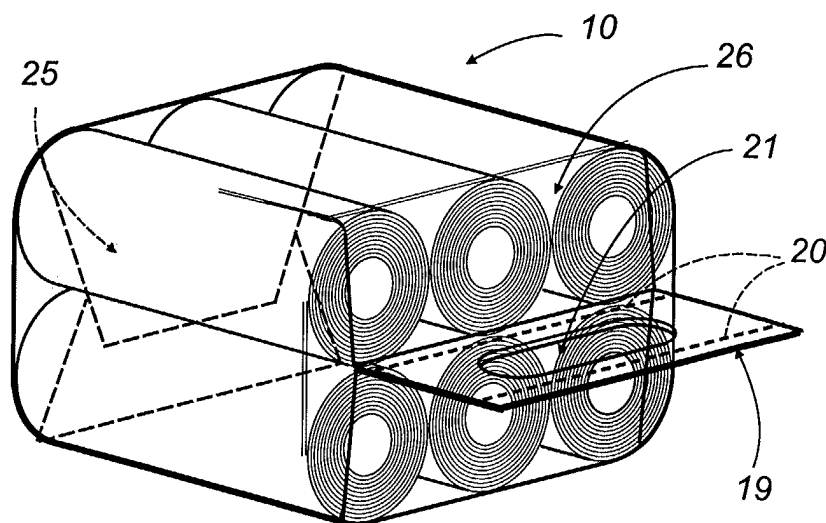
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(54) **A method and apparatus for the production of packs of rolls of paper with carrying handle**

(57) A method for the production of packs (10) of rolls of paper, in which the rolls are collectively wrapped with a sheet (11) of plastic film which is folded and sealed, allows a rational method of closing one front surface (26) of packs (10) and the simultaneous automatic production of an opening (21) at the surface for the pack (10) handle. An apparatus for implementing the method

comprises suction plates (12, 13), which move vertically in opposite directions to join end flaps (17, 18) of the sheet (11) of plastic film, closing the pack (10). The flaps are joined with the aid of means designed to neatly arrange the material of the side surface (28) of the sheet (11) between the flaps (17, 18) inside the flaps as they are joined. Further means seal the two flaps (17, 18) and make a pack (10) handle opening (21).

FIG.5



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Description

[0001] The present invention relates to a method for the production of packs of rolls of paper with relative carry handle.

[0002] In particular, the present invention is usefully and advantageously applied in the production of packs containing numerous rolls and/or in packs on which the height of the closing side is quite significant.

[0003] The production of packs of rolls of paper intended, for example, for use as toilet or kitchen rolls, is currently carried out using machines designed to: automatically wrap sheets of polythene film, or similar material, around the side surfaces of the rolls arranged neatly in one or more rows; close the front surface of the pack by folding the end flaps of the polythene sheet over the bottom surfaces of the rolls contained in the pack; and finally, seal the folded flaps together.

[0004] For packs with dimensions such that they contain a large number of rolls, packaging is completed with the application of a strip, again made of polythene or a similar material, whose ends are fixed to the two sides of the pack at one of the two front surfaces and which is long enough to be used as a handle for picking up and carrying the pack.

[0005] Alternatively to the above-mentioned packaging, for large packs, plastic bags are used, already produced before the rolls are packaged in collective packs, these bags offering suitable convenience and guarantees but obviously increasing production costs.

[0006] The aim of the present invention is to propose a method for the production of packs of rolls of paper which allows packs to be obtained by wrapping with a plastic film which is folded and sealed, complete with a pack carry handle.

[0007] Another aim of the invention is to propose a method for the automatic production of packs of rolls which is extremely effective even for packs in which the height of the closing side is significant relative to the width.

[0008] A further aim of the invention is to propose an apparatus for the automatic production of packs of rolls of paper with sheets of plastic film with an integral pack carry handle.

[0009] Accordingly, the present invention achieves the above-mentioned aims with a method for the production of packs of rolls of paper, the packs having a substantially prismatic shape, in which the side surfaces are wrapped with a sheet of plastic film and in which one front surface is closed by folding the external flaps of the sheet then sealing the folded flaps to one another. The method is characterised in that the other front surface of the pack is closed with the steps of: using retaining plates to hold the flaps so that they lie parallel with the side surfaces of the pack of which they are respective extensions; bringing the flaps together, allowing them to slide in a controlled way at a tangent to the plates; and gradually inserting between the flaps the

side surfaces of the sheet adjacent to them as they are brought together. This pack production method also comprises further steps of stably connecting the flaps joined to one another; and finally, of making an opening in the flaps which can be used as a pack carry handle.

[0010] Similarly, the present invention provides an apparatus for the automatic production of packs of rolls of paper wrapped in sheets of plastic film, characterised in that it comprises suction plates, which move vertically in opposite directions, to bring together two opposite flaps of the sheet of plastic film at one of the two front surfaces of the pack, keeping them stretched out opposite one another, with the possibility of sliding at a tangent to these suction plates. The apparatus also comprises: means designed to neatly push the material of the side surfaces of the sheet located between the flaps into the space between the two flaps, gradually as they are brought together, and means designed to seal the two flaps once they have been brought together; and means designed to make an opening in the surface at which the two flaps are joined.

[0011] The means designed to neatly arrange the material of the side surfaces of the sheet of polythene film in the space between the two flaps as they are brought together advantageously consist of devices which emit air flows with adjustable direction and intensity.

[0012] The features and advantages of the method disclosed are evident from the above description and, in particular, the advantage of being able to make the handle directly in the sheet of plastic film used to wrap the pack is obvious, as well as the possibility of continuing to use the same basic machines currently used to make packs with the plastic film wrapping technique.

[0013] Other features and advantages of the invention are more clearly indicated in the detailed description which follows with reference to the accompanying drawings which illustrate a preferred non-restricting embodiment of it and in which:

- Figure 1 is a perspective schematic view of a pack of rolls of paper in an initial configuration relative to the closing step of the pack production process in accordance with the present invention;
- Figures 2 and 3 illustrate two different successive configurations of the pack illustrated in Figure 1 and of the main elements of an apparatus used to implement the method in accordance with the present invention;
- Figure 4 illustrates the pack of rolls shown in the previous figures, after a further step of the pack production method in accordance with the present invention;
- Figure 5 illustrates the pack of rolls at the end of the pack production process in accordance with the present invention.

[0014] With reference to Figure 1, the numeral 10 denotes as a whole a pack which has a substantially pris-

matic shape, containing rolls of paper, for example toilet or kitchen rolls. In this example of a possible embodiment of the invention, the pack has two layers of three rolls neatly arranged next to one another.

[0015] The pack of rolls is already partially wrapped in a sheet 11 of a plastic material, for example a film made of polythene or an equivalent material, preferably in one piece.

[0016] More specifically, the side surfaces of the pack 10 and one 25 of the two bottom surfaces are already wrapped, using conventional techniques and apparatus (of the known type and therefore not described in detail here).

[0017] As will be seen, the other bottom surface 26 is closed using an apparatus which comprises suction plates 12, 13, which move vertically in opposite directions, close to the surface 26 to be closed.

[0018] As illustrated in Figure 3, the two plates 12, 13 have apertures 14 evenly distributed on their front feed faces 27. The apertures 14 are connected, for example by rods 15 and 16 cables which support and move the plates 12 and 13, to suction means operating with a vacuum which guarantee that the flaps 17, 18 of the sheet 11 which constitute the extensions of the larger side surfaces of the pack 10 adhere between the plates 12 and 13.

[0019] As the plates 12, 13 move vertically towards one another, they force the flaps 17, 18 together, as illustrated in Figure 1, until they make contact with one another.

[0020] During this operation for bringing together the two flaps 17 and 18, they are neatly arranged, as illustrated in Figure 2, thanks to the possibility of sliding at a tangent between the suction plates 12 and 13, whilst the side surfaces 28 are positioned towards the inside of the space between the two suction plates 12 and 13. This latter action takes place thanks to the use of suitable means designed to emit air flows, with suitable intensity, in the directions indicated by the arrows F.

[0021] Adherence between the suction plates 12, 13 and the flaps 17, 18 of the sheet 11 of plastic film is suitably regulated and metered, at the various points of the stroke, so as to allow the flaps 17, 18 to slide relative to the front faces 27 of the suction plates 12 and 13 and, at the same time, hold the flaps 17 and 18 in the stretched configuration opposite one another, as illustrated in Figure 2, to guarantee that the material is neatly arranged between them.

[0022] This provides, in the configuration illustrated in Figure 3, an even layer 19 of plastic material, with the shape illustrated. This shape is then definitively fixed, that is to say, defined, by a sealing operation using techniques and means known in the sector. Figures 4 illustrates some possible seal lines 20 with a dashed line.

[0023] The subsequent operation, performed in accordance with the method disclosed, consists of making a central cavity 21 in the layer of plastic material 19, with a shape and dimensions such that it may be used as a

pack 10 handle.

[0024] This operation may be performed, for example, by punching the layer 19 using suitable punches, also obviously known in the sector.

[0025] The present invention has obvious industrial applications. The advantages in terms of rationality and efficiency of the pack production method proposed are evident, as is the structural simplicity of the associated apparatus, which can easily be implemented in the basic structure of production lines which are already known and consolidated in the sector, such as those operating with the technique in which polythene film is wrapped around packs of rolls.

[0026] Obviously, such features and advantages remain within the scope of the invention concept, despite modifying or varying the preferred embodiment described above.

[0027] Clearly, the method disclosed may be applied for the production of packs of rolls comprising a different number of rolls to the example illustrated.

[0028] The shape and dimensions of the suction plates 12, 13 may vary according to the dimensions of the pack to be produced and the type of film, and the shape and distribution of the apertures 14 in the plates may vary.

[0029] The suction means connection to the apertures 14 may be of various types and strengths, according to the applications, and the same applies to the relative adjusting means.

[0030] Obviously, the dimensions and positions of the sealing bars and punches used to make the opening 21 may vary.

[0031] The invention may be subject to other practical - application modifications without thereby departing from the scope of the inventive concept as defined in the claims.

Claims

1. A method for the production of packs (10) of rolls of paper, the packs (10) having a substantially prismatic shape in which the side surfaces are wrapped with a sheet (11) of plastic film and in which one front surface (25) is closed, the method being **characterised in that** the other front surface (26) of the pack (10) is closed with the steps of: using retaining plates (12, 13) to hold the flaps (17, 18) so that they lie parallel with the side surfaces of the pack of which they are respective extensions; bringing the flaps (17, 18) together, allowing their controlled sliding at a tangent to the plates (12, 13); and inserting the side surfaces (28) of the sheet (11) adjacent to them between the flaps (17, 18) gradually as they are brought together; the pack production method comprising the further steps of stably connecting the flaps (17, 18) joined together, forming a single appendage (19); and making an opening (21) in the

appendage (19) for use as the pack (10) handle.

2. The method according to claim 1, **characterised in that** as the flaps (17, 18) are brought together, gradually being joined, the material of the other two side surfaces (28) of the sheet (11) of plastic film is neatly arranged by the action of thrust means directed at the side surfaces. 5
3. The method according to the foregoing claim, **characterised in that** the thrust means consist of air flows of suitable intensity directed at the side surfaces. 10
4. The method according to claim 2, **characterised in that** the two opposite flaps (17, 18) of the sheet (11) of plastic film are held stretched out opposite one another by the retaining plates (12, 13) which operate by sucking the flaps (17, 18) of the sheet (11) of polythene film, the suction from the plates (12, 13) being modulated according to points of the stroke on which the flaps (17, 18) are brought together. 15 20
5. An apparatus for the automatic production of packs of rolls of paper wrapped in sheets of film made of polythene or a similar material, **characterised in that** it comprises suction plates (12, 13) which move vertically in opposite directions to bring together the opposite flaps (17, 18) of the sheet (11) of plastic film located at one (26) of the two front surfaces (25, 26) of the pack (10), keeping them stretched out opposite one another, with the possibility of sliding at a tangent to the suction plates (12, 13); the apparatus also comprising: means designed to neatly push the material of the side surfaces (28) of the sheet (11) between the flaps (17, 18) into the space between the flaps, gradually as they are brought together; means designed to connect the two flaps (17, 18) once they have been brought together; and means designed to make an opening (21) in the surface on which the two flaps (17, 18) are joined. 25 30 35 40
6. The apparatus according to claim 5, **characterised in that** the means designed to neatly push the material of the side surfaces (28) of the sheet (11) between the flaps (17, 18) into the space between the two flaps (17, 18) consist of means which emit air flows with adjustable intensity and direction. 45
7. The apparatus according to claim 5, **characterised in that** the means designed to connect the two flaps (17, 18) of the sheet (11) of plastic film comprise sealing means designed to seal the two flaps (17, 18) along parallel seal lines (20). 50 55
8. The apparatus according to the foregoing claim, **characterised in that** the parallel seal lines are close to the internal and external edges of the sur-

face on which the flaps (17, 18) are joined, forming a layer of material (19).

9. The apparatus according to claim 5, **characterised in that** the means designed to make an opening (21) in the layer of material (19) comprise punches with dimensions and shape useful for obtaining openings (21) suitable for a pack (10) handle.

FIG.1

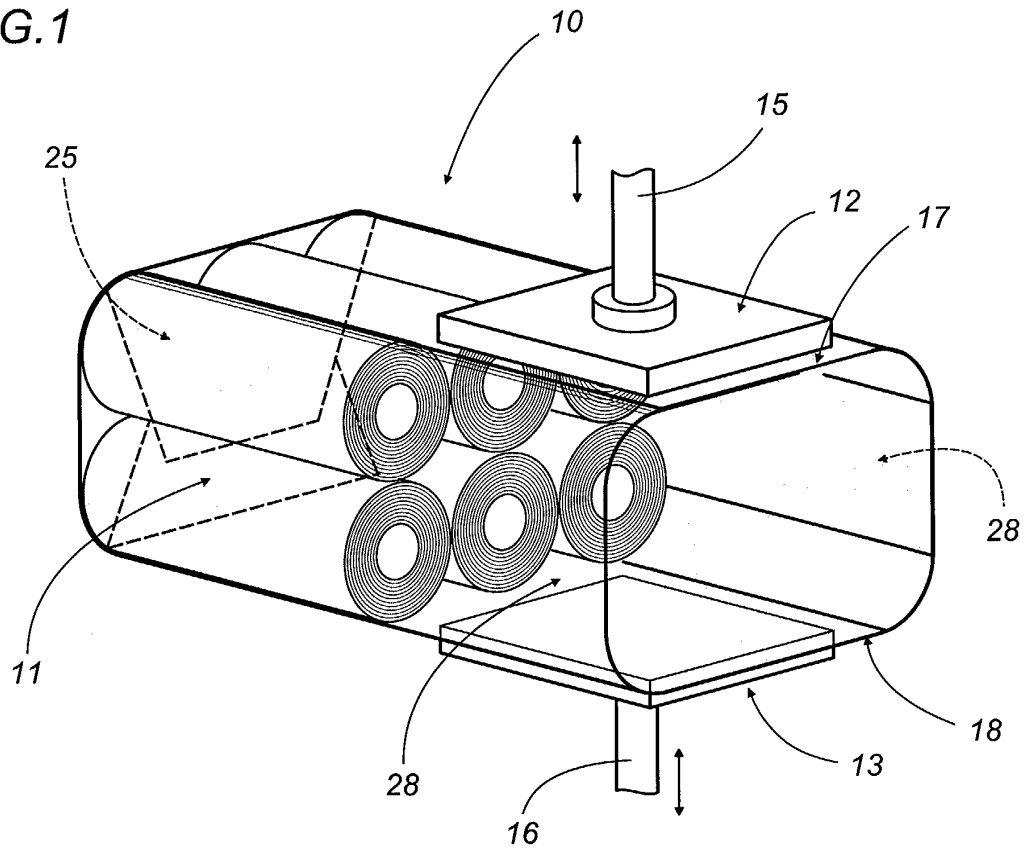


FIG.2

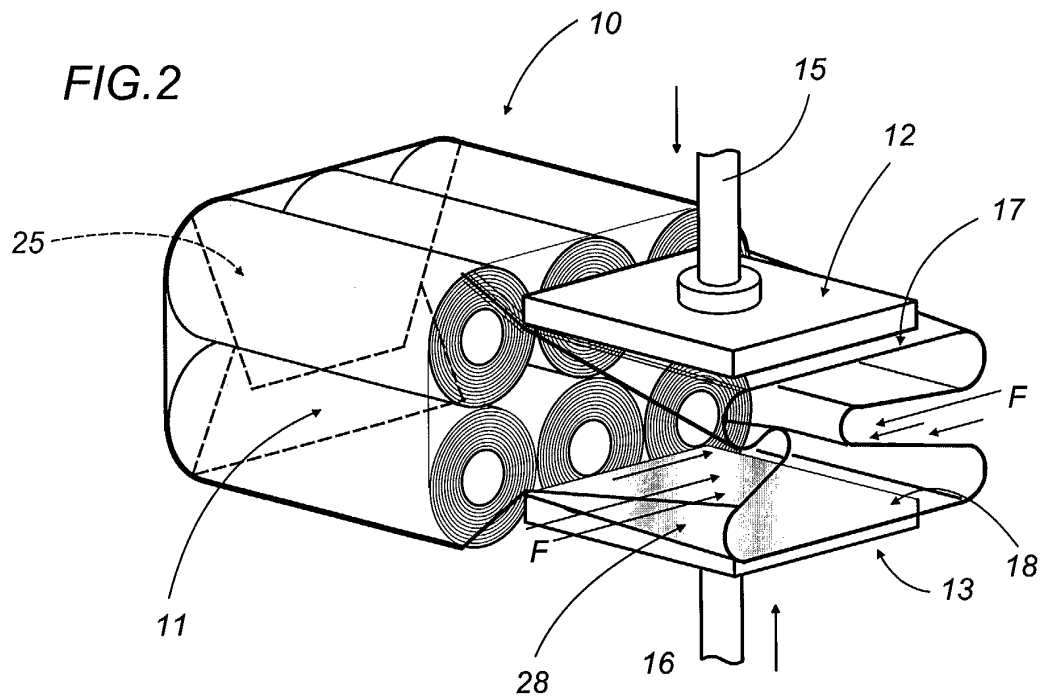


FIG.3

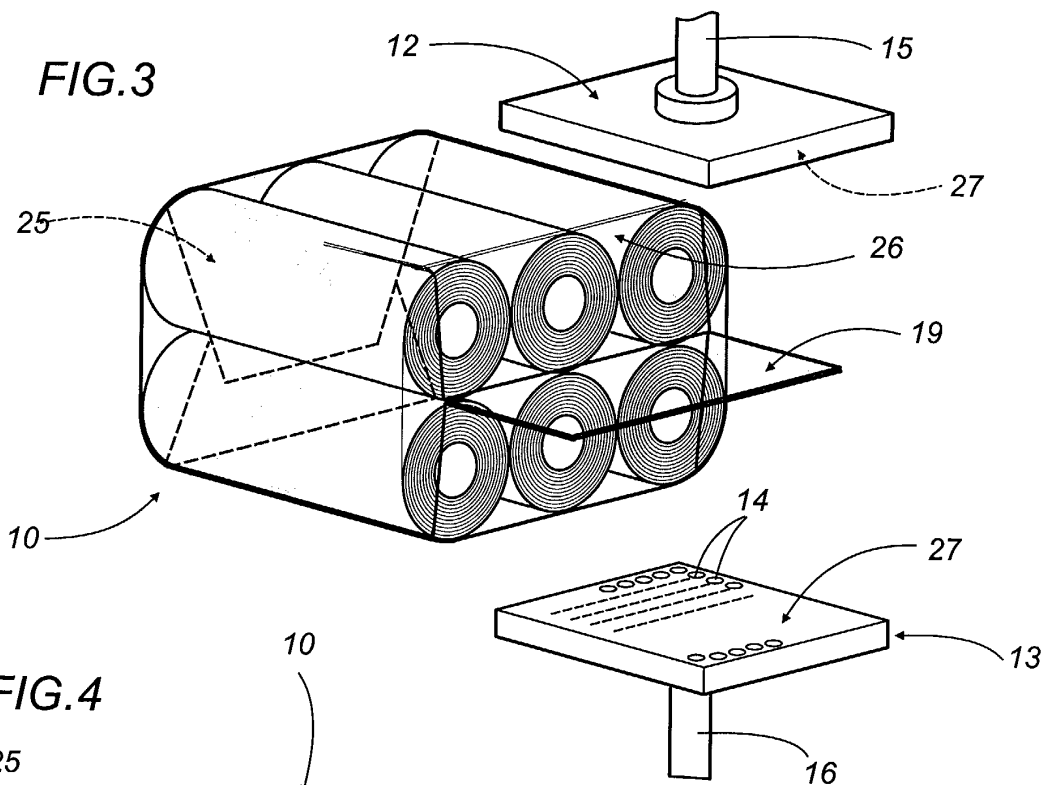


FIG.4

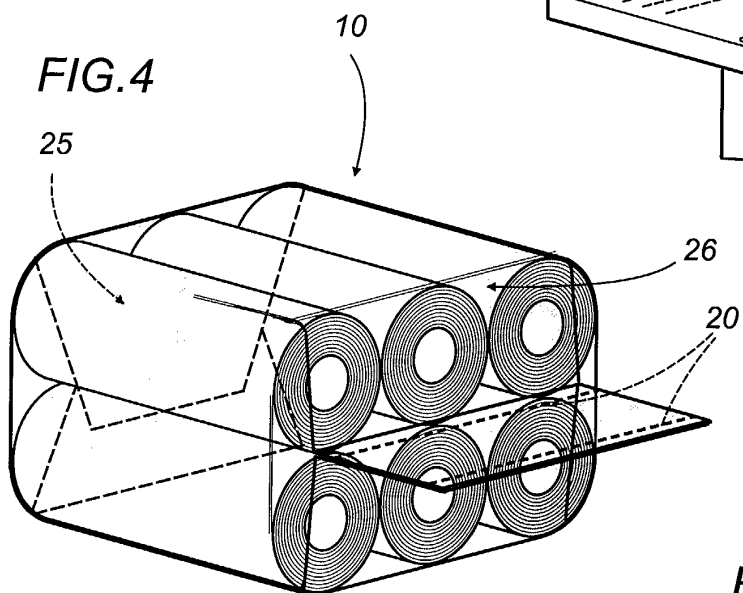


FIG.5

