



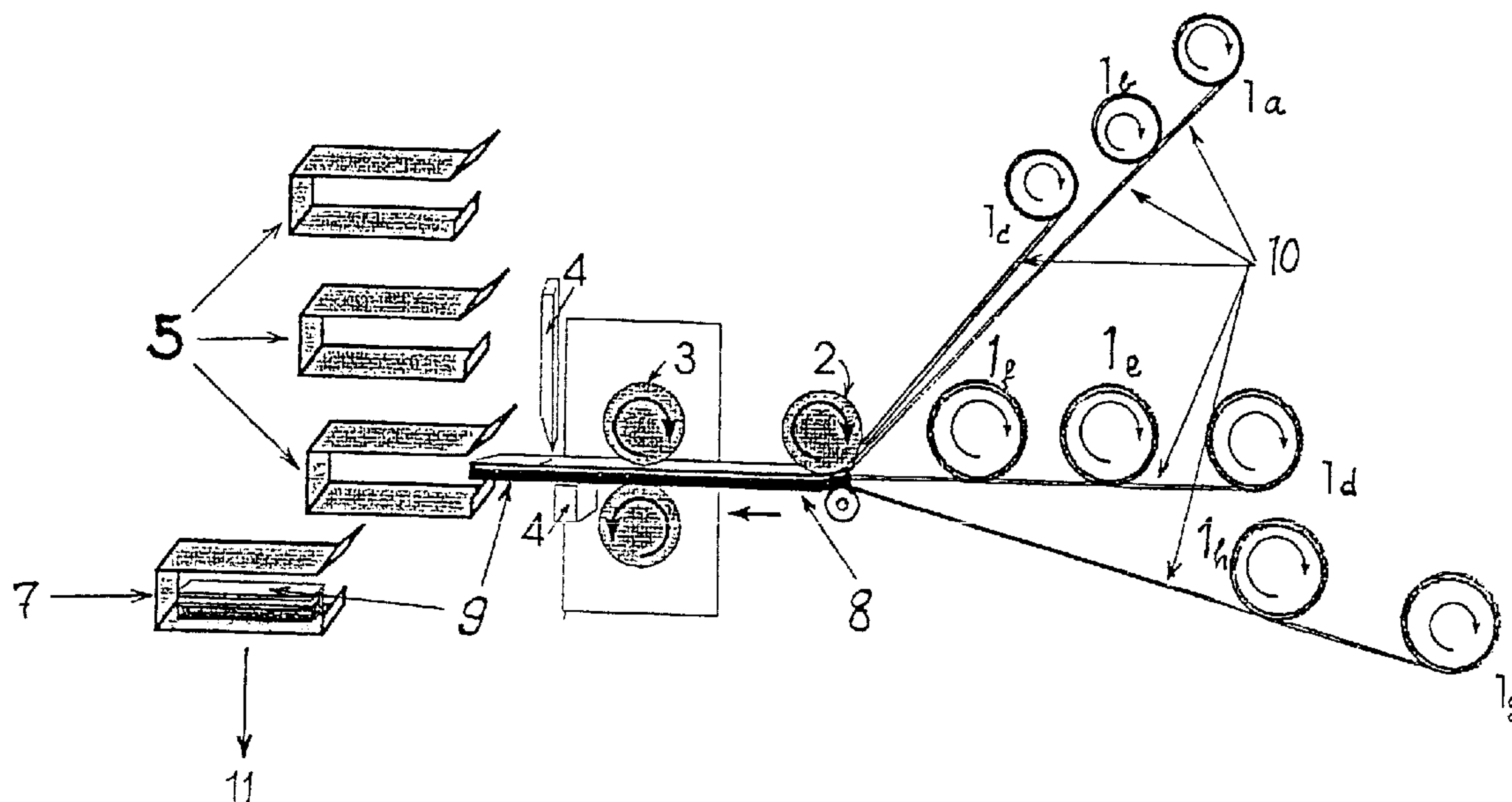
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(54) **PROCEDE ET DISPOSITIF POUR L'INTRODUCTION D'UNE
PLURALITE DE FORMES DE PRESENTATION EN FEUILLES
INDIVIDUELLES DANS UN DISTRIBUTEUR, AVEC
FORMATION D'UNE PILE MULTICOUCHE**

(54) **METHOD AND DEVICE FOR INSERTING A PLURALITY OF
INDIVIDUAL SHEETLIKE FORMS OF ADMINISTRATION IN
A DISPENSER BY FORMING A MULTILAYER PILE**



(57) Procédé pour l'introduction d'une pluralité de formes de présentation en feuilles dans un distributeur, avec formation d'une pile multicouche, en vue d'un prélèvement dosable individuellement, en utilisant comme matériau de départ des bandes de feuilles (10) enroulées sous forme de rouleaux (1), caractérisé en ce

(57) The invention relates to a method for inserting a plurality of individual sheetlike forms of administration in a dispenser by forming a multilayer pile for individual doses, using sheetlike bands (10) wound in rolls (1) as a starting material. The inventive method is characterized by the following work steps: in a first work step a



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qu'il comprend les étapes ci-après: dans une première étape, une pluralité de couches en feuilles, des bandes correspondant à la pile (9), est extraite simultanément de plusieurs rouleaux (1); dans une deuxième étape, les bandes individuelles (10) sont réunies, par l'intermédiaire de moyens de guidage (2) en une ligne multicouche (8), celle-ci est envoyée, dans une troisième étape, vers un poste de découpe (4), où une longueur de pile (9) est séparée, et celle-ci, dans l'étape suivante, est introduite, avec au moins une pile (9) de couches individuelles détachées, dans un distributeur (5).

plurality of sheetlike plies of the bands (10) corresponding to the pile (9) are taken out simultaneously from several rolls (1); in a following work step the individual bands (10) are assembled in a multilayer strand (8) using guiding elements (2); in a third work step said strand is pulled towards a cutting station (4) and cut to the length of a pile (9) which is then, in a subsequent work step, inserted along at least one pile (9) of loose individual plies in a dispenser (5).

ABSTRACT

A process for introducing a plurality of segregated sheet-like administration forms into a dispenser under formation of a multilayered stack for individually dosable removal, with sheet-like tapes (10), wound-up in rolls (1), being present as starting material, characterized by the following steps:

- 10 - in a first step, a number of sheet-like layers of said tapes (10), which number corresponds to the stack (9), is simultaneously drawn from a plurality of rolls (1),
- 15 - in a further step, the individual tapes (10) are united, using guide means (2), to form a multilayered strand (8), which
- 20 - in a third step, is drawn forward to a cutting station (4) where one length of stack (9) is severed at a time; which length
- in a subsequent step, is introduced with at least one stack (9) of loose individual layers into a dispenser (5).

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This invention relates to a process as well as a device for introducing a plurality of segregated sheet-like administration forms into a dispenser under formation of a multilayered stack for individually dosable removal, with sheet-like tapes, wound in coils, being present as starting material. The administration forms may for application thereof contain therapeutic or cosmetic or food-technological products.

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Flat-shaped administration forms intended for use in the oral region and on the mucous membranes of the mouth are known. Thus, US 3 444 858 (1969) describes medicament strips on the basis of a gelatinous material.

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Furthermore, proposals to use such sheets outside the medical field are known. In EP 0 216 762 there is disclosed a water-soluble sheet of starch, gelatine, glycerine or sorbite, which is coated by means of a roll coater. It is mentioned in the said document that such dosage forms can also be manufactured, for example, for chemical reagents, flavours and the like.

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On the market, administration forms with single-unit dispensers made from plastics material have been available since about 1995 and have become established in the fields of application of cosmetics and sweets; mention is made here of the product by Nisshin, Japan. The single-unit dispensers contain stacks of superimposed sheet sections which permit the individual removal of the respective upper piece of sheet after opening of an opening lip.

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The technical solution to the task of producing and packaging such stacks of sheet-like starting material is, however, difficult; the literature provides no practicable instructions for their manufacture. Only US 4 180 558
5 describes the stacking of edible webs, which are, however, laminated together upon another at their edges and which therefore are unsuited for the aforementioned mode of application.

Since such sheet-like administration forms tend to become
10 statically charged owing to their small weight per unit area, e.g. between 10 and 50 g/m², and since the surfaces must be adapted so as to be slidable for ready removal of the webs, it is only with great difficulty and great expenditure of time that one succeeds in the accurately
15 positioned cutting and superimposing of the sheet sections.

Observing the manufacturing techniques in industrial fields such as the manufacture of paper or the packaging of plastics bags does not provide any practicable suggestions
20 for solving the problem. Although in US 4 070 014 there is described the formation of stacks from two different types of paper in partially overlapping arrangement with the aid of vacuum suction transfer rolls, this technique, like the technique for stacking paper known from US 5 348 527, de-
25 scribes a comparatively time-consuming process involving individual cuts from a roll and individual deposition on a stack.

US 4 406 650 describes the formation of a web of paper from
30 a roll, said web being folded in a zig-zag configuration and from which by means of cutting there results a stack. A disadvantage here are the cuttings of the material. If the upper and bottom faces of the web have different structures, or in the case of undulation, it is not possible here
35 to stack the individual sheets with their original upper side facing upwards.

Starting from the aforementioned state of the art it is the object of the present invention to provide a process and a device of the kind mentioned in the introductory part of Claim 1 which, while avoiding the aforementioned disadvantages and difficulties, enables the introduction into a dispenser of individually dosable sheet-like administration forms into a dispenser in a precise manner and at high process speeds and under formation of a multilayered stack, with sheet-like tapes, wound-up in coils, being present as starting material.

This object is achieved according to the invention in a process of the kind mentioned in the introductory part of Claim 1 by means of the sequence of steps indicated in the characterising part of said claim.

With advantage and in a surprisingly simple procedure, the stack is formed in an exact manner by simultaneous unwinding of a plurality of single rolls of the sheet-like intermediate product, superimposing of the individual webs, jointly cross-cutting the resultant multiple laminate strand and cutting the stacks into lengths; and is conveyed into the dispenser. With great advantage, the process according to the invention is suitable for exact operation at high speed.

The intermediate product of the narrow rolls provided for this purpose consists, for example, of about 20- to 1000-m-long, wound-up individual webs having the width of the product, which webs can be produced by means of roll cutting from an original broad width material.

In the simplest case, a number of narrow rolls corresponding to the number of sheet pieces per dispenser is, to this end, fixed freely rollable on axles in the vicinity of a stack to be manufactured.

The rotation and unwinding directions of the rolls are preferably the same, and the material is drawn and guided jointly from all of the rolls by means of pulling devices known to those skilled in the art. The resultant multiple
5 laminate strand is then fed to a cross-cutting device under control and levelling of the lateral edges, behind which cross-cutting device there is disposed, in an open state, the dispenser which is to be supplied.

10 The narrow rolls used may be of almost any geometry. Good results can be obtained with roll widths between 5 and 40 mm. The length of the coiled material should be at least about 20 m, preferably more than 500 m, per roll in order to avoid frequent interruption of the operation. Uniting
15 two or more tapes in advance and simultaneous winding or unwinding is possible, but frequently leads to difficulties when many layers are being wound. Surprisingly, it has proved impossible to unwind a laminate consisting of eight or more such sheet layers in a controlled process since
20 those laminate elements of the sheet strips which lie on the outer radius slightly longer than the inner laminate elements. When unwinding the rolls, in the case of more than four laminate layers this would lead to diverging of the webs and thus to an interruption of the process.

25 For this reason, winding and unwinding of rolls having few - e.g. up to four - laminate elements is preferably utilized.

30 The type of dispenser is of no significance to the application of the present invention. Dispensers of plastics material or cardboard can be filled without problems. The opening side may, in the case of rectangular sheet sections, be at the narrow side, in which case the pre-cut
35 narrow rolls have the width of the small side length of the rectangle.

If the narrow rolls are, however, configured in the later longitudinal dimension of the sheet sections, the opening side of the dispenser is on one of its longitudinal sides.

5 In the case of two-piece dispensers it would be expedient to primarily fill a bottom part, e.g. configured in the shape of a drawer, and subsequently to place the top part thereon. It is also possible, however, to fill half-opened dispensers. Also, it is possible to fill sealing bags,
10 which, especially in the case of a peelable configuration, can be used as a dispenser, for instance by placing the cut stack on the bottom web of an advancing sealable packaging material web, and subsequently, after feeding of the upper web of the packaging material, sealing the resultant bag.

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Details, features and advantages of this invention will become apparent by way of example from the following explanation of a process flow sheet which is schematically illustrated in the drawing. The flow sheet shows:

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The device for introducing a plurality of individual film-shaped administration forms into a dispenser under formation of a multilayered stack (9) for individually
25 dosable removal comprises according to Figure 1 an indefinite number - depending on the number of layers - of rolls (1a to 1h) with active substance-containing tapes (10) wound thereon.

Said tapes (10), upon being unwound, travel at different angles to the horizontal to guide rolls (2) and pass
30 between said rolls, with the tapes (10) being combined in the process to a multilayered strand (8). Strand (8) is gripped by a pair of conveying rolls (3) and drawn to a cutting device (4). Having reached the end of the transport path, there is severed from the strand (8) by means of the
35 cutting device (4) one multilayered stack (9) at a time, consisting of loose administration forms superimposed upon

each other in exact alignment, and filled into a dispensing container (5), which is held ready, after the dispenser (5) having previously been automatically brought to the filling position by means of a conveyor device (not shown). In the process, the dispenser (5) is loaded with at least one stack (9). Depending on the material and on the task to be solved, a dispensing container (5) may also be loaded successively with a plurality of stacks (9). The loaded container is then transported by means of the conveyor device (11).

The process and device are surprisingly simple, they can be realised in a cost-effective manner, and offer an ideal solution to the task set at the outset.

C L A I M S

1. Manufacturing process for individually dosed sheet-like administration forms arranged as a stack in a dosage dispenser, comprising equal-sided superimposing of the individual webs of the sheet-like intermediate product to form a multilayered strand (8) employing guide means (2), jointly cross-cutting the resultant strand (8), and filling a dispenser, characterized in that the administration forms are such as are intended for therapeutic, cosmetic or food-technological products, and that they, at the time of cross-cutting, are arranged substantially within the dispenser (5), having been shifted to that position.
2. Process according to Claim 1, characterized in that dispenser (5), after filling and closing thereof, is automatically led away from the loading station, and an empty dispenser (5) is automatically fed in its place.
3. Process according to Claim 1 or 2, characterized in that on one roll (1) there are wound at least two sheet-like tapes (10) with equal orientation of their top and bottom faces.
4. Process according to one or more of Claims 1 to 3, characterized in that instead of dispensers (5) there are used sealing bags for receiving the stacks (9).
5. Process according to one or more of Claims 1 to 4, characterized in that the drawing of tapes (10) from their rolls (1) is supervised optically, and that when a tape end appears, the work process is stopped.
6. Process according to one or more of Claims 1 to 5, characterized in that into a dispenser (5) there are introduced at least two stacks (9).

7. Device for introducing a plurality of segregated sheet-like administration forms into a dispenser (5) under formation of a stack (9), with:

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- sheet-like tapes which can be unwound,
- at least one guide element (2) for uniting the tapes (1), which are fed from various directions, to form a strand (8),

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- an advancing device (3) for strand (8), and
- a cutting device (4), as well as

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- transport and control means for feeding empty dispensers (5) and for leading away dispensers (5) filled with loose-leaf stacks (8), characterized in that the cutting device (4) is arranged between the advancing device (3) and the dispenser (5) which is in its filling position.

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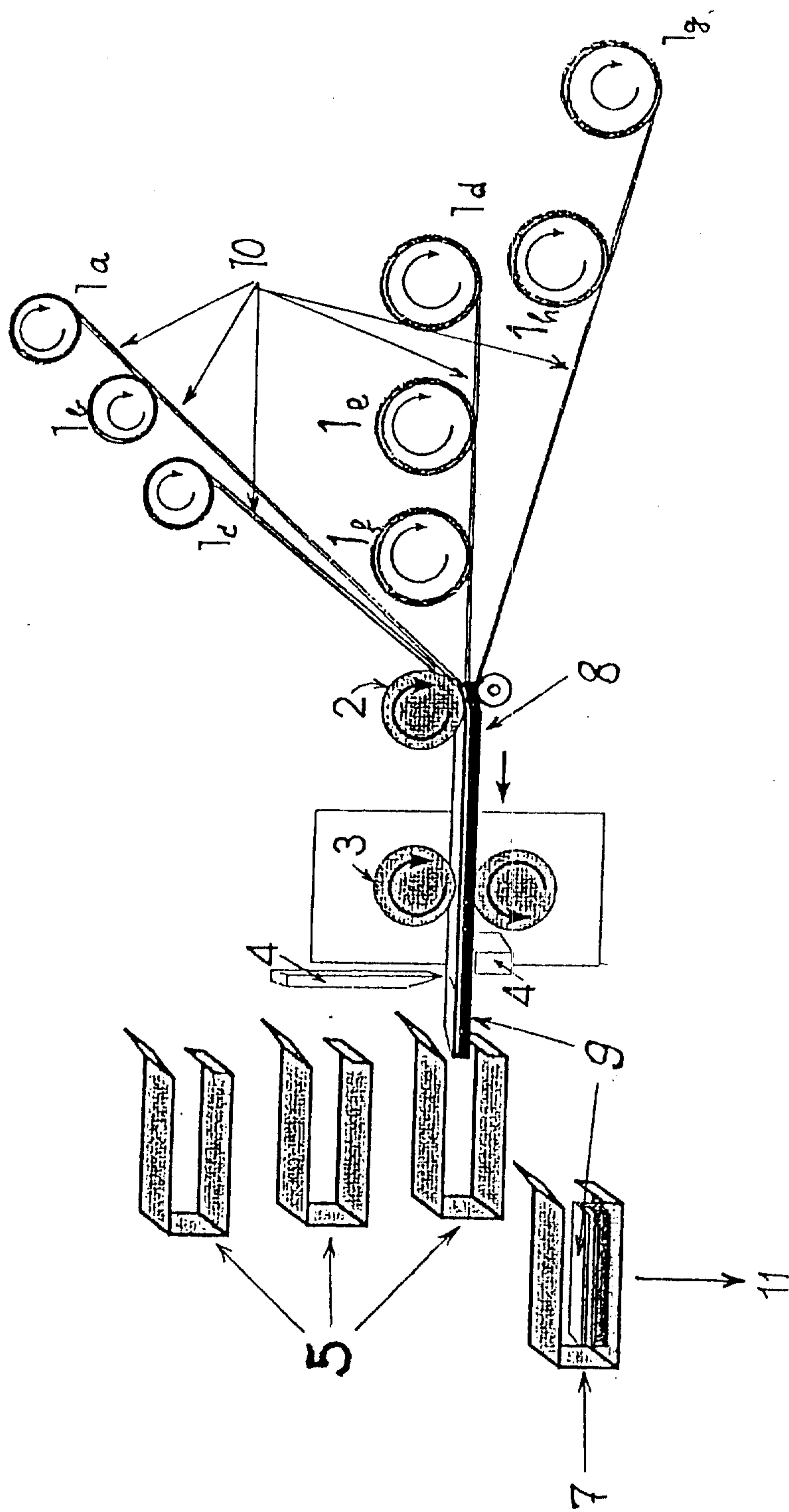


FIG. 1

