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**None**

(58) Field of search  
**B8C**

(54) **Machine for the production and packaging of infusion bags**

(57) A machine for the automatic production and packaging of infusion bags containing e.g. tea or camomile, comprises a multidosing drum for depositing successive pairs of discrete doses of the infusion product side by side along a first web of filter paper while advancing the web generally horizontally, means for superimposing a second web of filter paper over the first web and for transversely and longitudinally sealing the webs to separately enclose each product dose in an infusion bag, means for severing the superimposed webs longitudinally and transversely to separate the infusion bags from one another, and means for stacking the separated bags side by side, the stacking means including a substantially vertical separator (24) for maintaining the separation of the stacks and pivotal retaining means (26) for retaining the bags in a stack formation. The retaining means (26) pivots between a vertical position which it occupies during stacking of the bags, and a horizontal position to engage the tops of the stacker during pushing thereof into clamping jaws which serve to load the stacks into a box therebelow.

Fig. 3

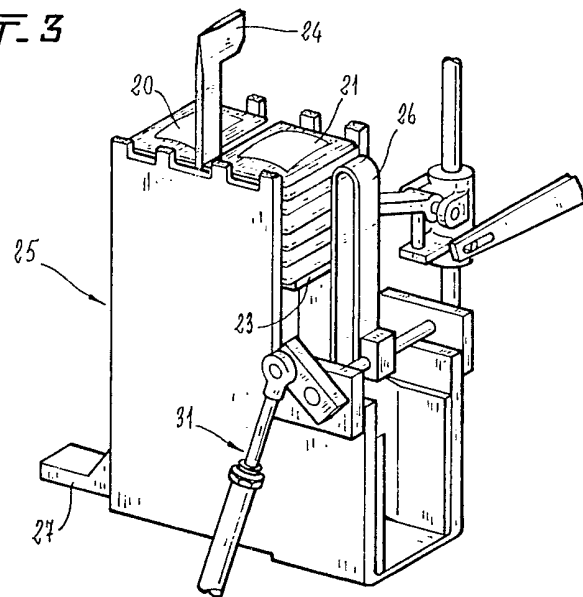


Fig. 1

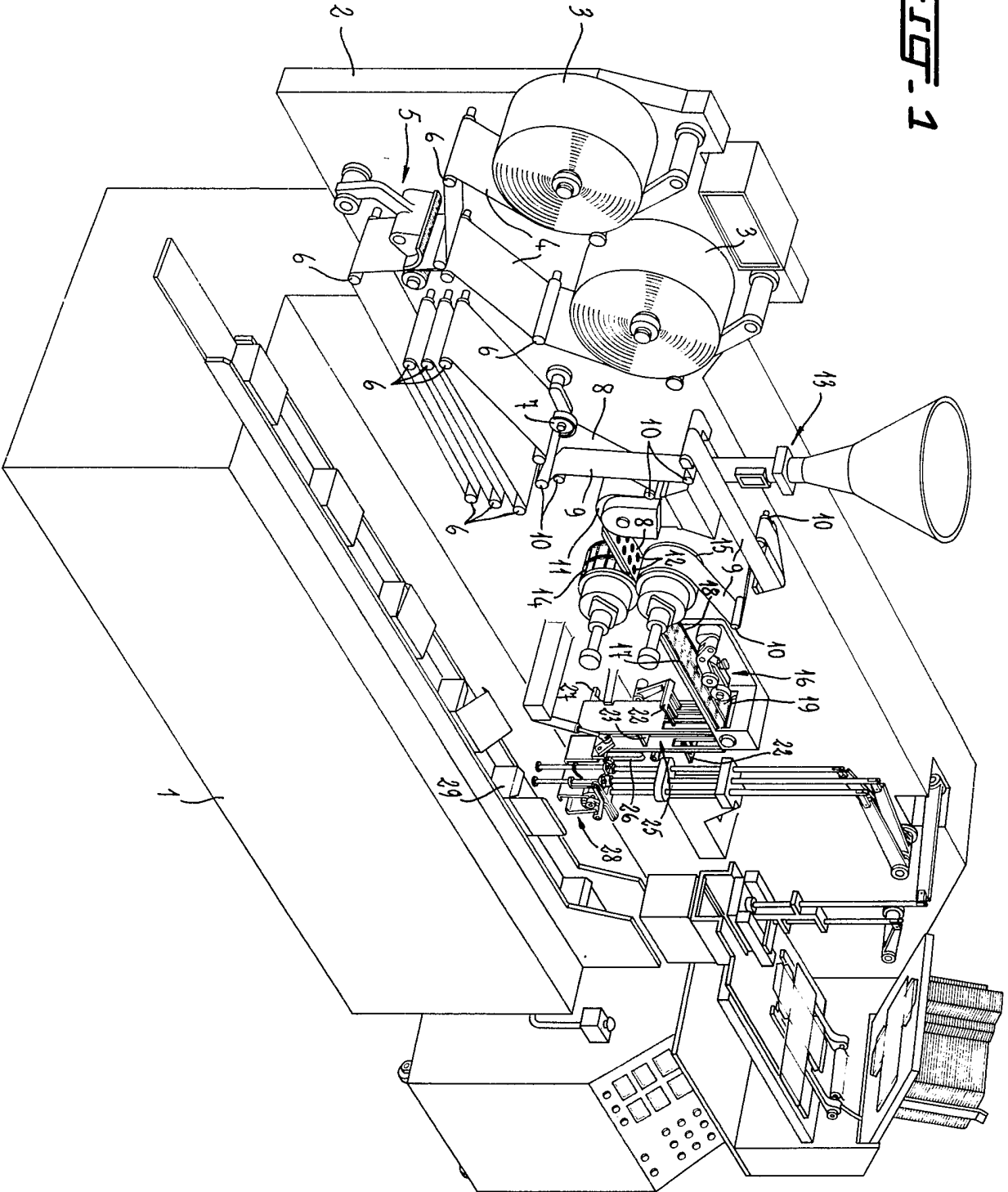


FIG. 2

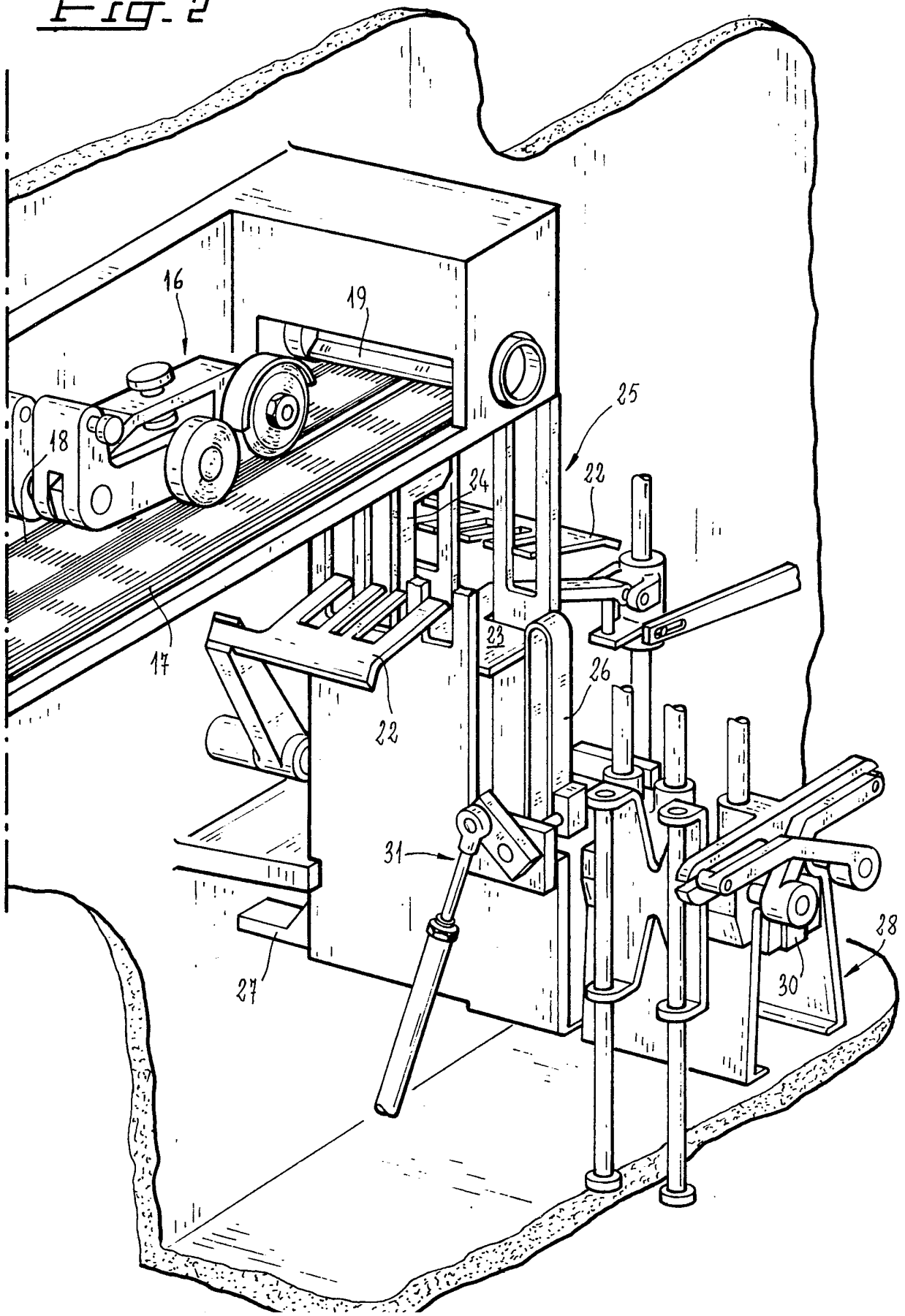


FIG. 3

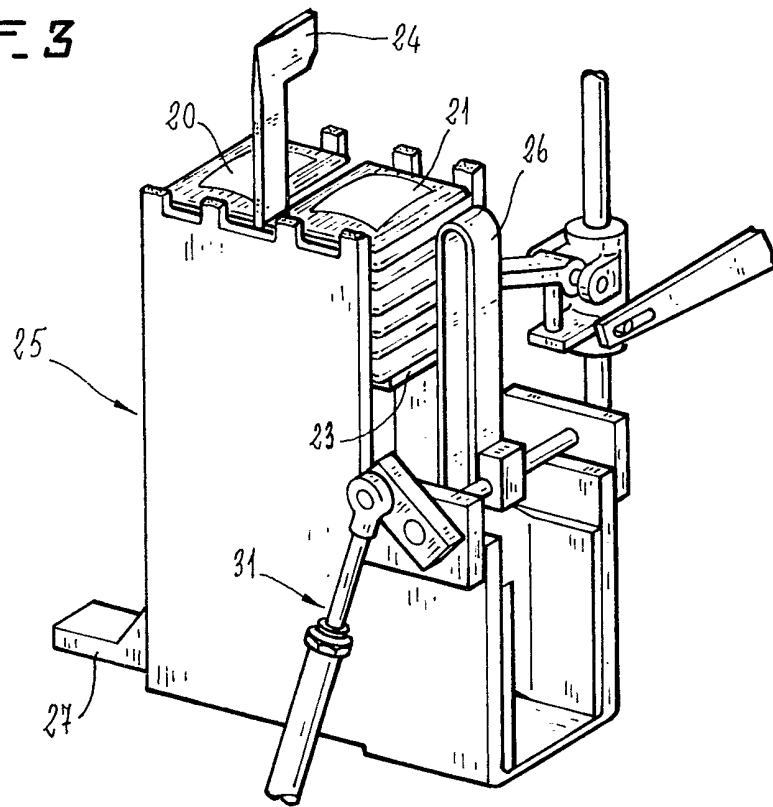
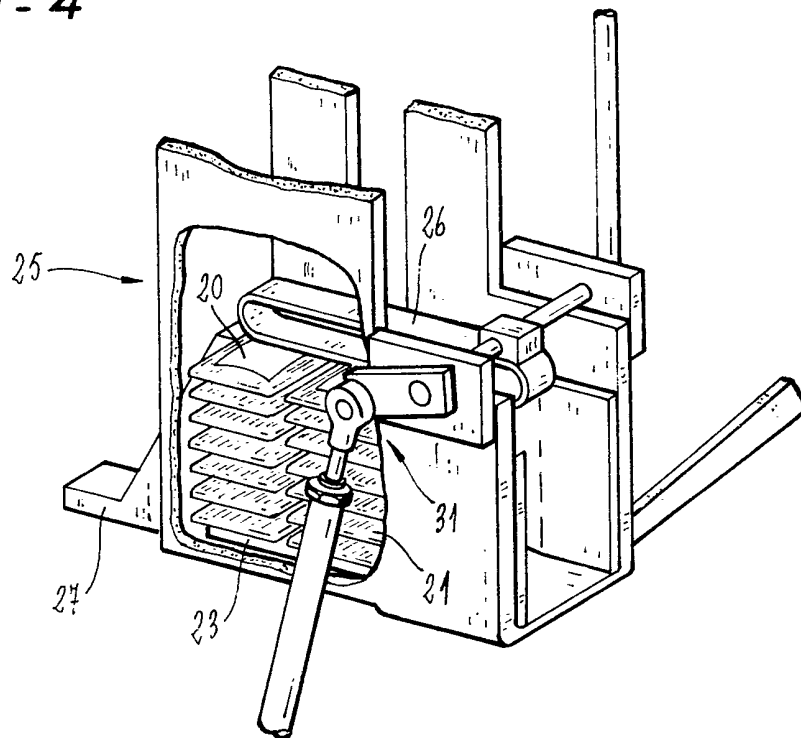


FIG. 4



## SPECIFICATION

**Machines for automatic production of filter bags for infusion products**

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This invention relates to improvements to machines for automatic production of filter bags for infusion products.

More specifically, this invention has the object of presenting improvements to the type of machines for the automatic production of filter bags for infusion products such as tea, camomile and similar, in which the filter bags are obtained from two webs of filter paper having the same width and advancing in super-imposed layers, of which one is wound around a multidosing drum for the infusion product which deposits in succession several doses placed transversally and side by side distant from each other on the same advancing web in a horizontal disposition and above which the other web advances, so that they are jointly passed through two drawing sealing rollers, contrarotating in parallel about the same horizontal axis to provide the longitudinal and transverse seal of the super imposed webs around each of said doses side by side and distanced transversally and longitudinally, cutting said paired and sealed webs lengthwise between longitudinal rows of doses transversally side by side and distanced, separating by transverse cutting said paired webs sealed and longitudinally cut so as to obtain pairs of filter bags transversally paired and side by side, stacking said pairs of filter bags according to a predetermined number transversally paired and side by side and placing the stacks thus obtained in boxes for sale.

Machines for obtaining and packaging in boxes pairs of filter bags according to the above operational sequence have already been available on the market under the brand names IMA C50 and IMA C51 for over twenty years.

The market for these filter bags joined side by side in pairs by a tear-separation line made up of perforations alternating with joining points or lines continues to demand boxes of stacks or pairs of filter bags, but in many cases with the requirement that the filter bags of each pair be no longer joined together by the tear-separation line but simply be placed side by side and totally divided from each other.

During the trials carried out to satisfy this market requirement with the present so-called automatic machines, numerous difficulties have been encountered both in the stacking of the individual filter bags simply transversely side by side and in the packaging of the stacks in boxes.

The object of this invention is therefore that of obviating the disadvantages occurring by providing improvements to this known type of machine, such as, in particular, to always maintain under control the individual filter bags of the pairs of filter bags side by side and to always maintain well stacked the stacks of said pairs of individual filter bags side by side when inserting them in the respective packaging boxes.

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The object of this invention is therefore to improve the machines for automatic production of filter bags for infusion products such as tea, camomile and similar where the filter bags are produced from two webs of filter paper having equal width and comprising baffles for deviating said two webs along super-imposed paths, of which one is wound around a multidoser drum for the infusion product which deposits in succession several doses placed transversally side by side and distant from each other on the same web advancing horizontally, above which the other web is advancing, so that they jointly pass through two drawing sealing rollers contrarotating in parallel about the same horizontal axis for sealing longitudinally and transversally said two superimposed webs around each of said doses longitudinally and transversally side by side and distanced from each other, cutting means in order to cut lengthwise said paired and sealed webs between the longitudinal rows of transversally adjacent doses, cutting means in order to cut transversally said webs paired and sealed so as to obtain filter bags transversally paired and side by side, stacking means in order to stack according to a predetermined number said filter bags transversally paired side by side and clamping means suitable to receive the stacks obtained and transfer them into packaging boxes, said improvements being characterized in that due to the fact that said cutting means are provided with a continuous sharp edge and that beneath the transverse cutting means, between the latter and the stacking means, are provided vertical separating and guiding means for the individual filter bags side by side and separated, controlled action retaining means for keeping under control the stacks of said individual filter bags side by side and separated during their transfer to the above-mentioned clamping means which provide for the transfer of said stacks into the packaging boxes, said clamping means presenting between the jaws of the clamp elastic buffer means in order to maintain compact the stacks of individual filter bags side by side and separated during their transfer into the above-mentioned packaging boxes.

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Further features and advantages of the improvements according to this invention shall become more evident from the detailed description that follows, of a preferred practical embodiment given here purely by way of non exclusive example and given with reference to the Figures of the attached drawings wherein:

*Figure 1* shows the improved machine according to this invention, according to a perspective view from the front;

*Figure 2* shows the part of said machine from a perspective view, on an enlarged scale, affected by the improvements in question; and

*Figures 3 and 4* show the part of machine improved as per *Figure 2* according to two different functional positions of the relevant members according to this invention.

The machine as per *Figure 3* improved by way of example according to this invention is the machine known on the world market under the brand name

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IMA C51 for making and packaging in boxes pairs of stacks of filter bags with which said filter bags are produced with filter paper web wound in rolls.

Such a machine is, as already stated above, essentially made up of a base 1 extending frontally lengthwise with an upper rear shoulder 2 supporting a pair of rolls 3 of filter paper web 4, usable on machines, according to the state of the art, with the aid of connecting or joining of the terminal end of one of the webs with the starting end of the other shown generally at 5.

The filter paper web 4 being unwound from one of the rolls 3 for usage is wound around several drive rollers 6 and is cut by means of cutting means 7 longitudinally into webs 8 and 9 of equal width that are diverted by transmission roller means 10 along superimposed paths. Web 8, on leaving one of said transmission rollers 10 is wound around a multidoser drum 11 of the infusion product which provides for the deposit of the then horizontally advancing web, successive pairs of doses 12 placed transversally side by side and distanced from each other, of infusion product which is fed to said multidoser drum 11 by a known hopper feeding system shown generally at 13.

In the meantime, web 9 conveniently diverted by the relevant driving rollers 10 reaches a point above said web 8 with doses 12 thereon so that they are jointly passed through the two known sealing rollers 14 and 15, of the drawing type and contrarotating in parallel about the same horizontal axis for the longitudinal and transversal seal of the said two webs 8 and 9 superimposed about each of the said doses 12 longitudinally and transversally side by side and distanced.

Above said two webs 8 and 9, just downstream of the exit from said two sealing rollers 14 and 15 are provided cutting means, indicated generally at 16, which cut, according to this invention, lengthwise said webs 8 and 9 paired and sealed between the longitudinal rows of doses 12 transversally side by side. The webs 17 and 18 thus obtained, each having a row of doses 12, then penetrate, in parallel and side by side, between cutting means 19 suitable for cutting transversally said webs 17 and 18 so as to obtain filter bags transversally side by side and separated shown at 20 and 21 (see Figures 3 and 4).

Said bags 20 and 21, transversally side by side and separated, beneath said transverse cutting means 19, are stacked with known oscillating stacking means 22 and on a vertically moving platform 23 with the help of vertical separating and guiding means 24 according to this invention (see Figures 3 and 4). Said separating and vertically guiding means 24 are made up of a vertical flat strip on the advancing plane of webs 17 and 18 which produce the individual filter bags 20 and 21, said plate 24 terminating on top in a protrusion or horizontal arm, tapered along its upper edge.

Said oscillating stacking means 23, vertically moving platform 23 and separators operate within a well 25 about which retaining means 26 also operate (described in more detail later on) having a

controlled action so as to keep under control the stacks of said individual filter bags, side by side and separated, 20 and 21.

A pusher 27 (See Figures 2, 3 and 4) transfers the pairs of stacks of individual filter bags side by side and separated with the help of said retaining means 26, to known clamping means 28 which in turn insert them in packaging boxes 29 advancing longitudinally below said clamping means 28. Said clamping means 28 have been provided according to this invention presenting between the clamping jaws elastic buffer means 30 to maintain compact the stacks transversally side by side of individual filter bags side by side and separated during their transfer to the said packaging boxes 29.

Said retaining means 26 are made up according to this invention of an elastic "leaf spring" element with an elongated ring, supported by a cantilever and oscillating about a horizontal axis and actuated by actuating means of any known type shown generally at 31, from a vertical position (see Figures 2 and 3) to a horizontal position (Figure 4) timed with the transfer of the stacks of filter bags side by side and separated by the stacking clamping means for insertion into the packaging boxes.

With a similar configuration of the machine improved according to this invention it has been possible in practice to achieve the aims mentioned above. In practice it has been possible to satisfy market requirements as referred to above, by the provision of simple but efficient and efficacious improvements to known machines such as those that have long been used and appreciated in this specific sector of production and known by the brand names IMA C50 and IMA C51.

In this embodiment obviously it is possible to carry out all those modifications and variations that fall within the scope of the content of the claims that follow. Of particular interest has been the possibility of being able to place the retaining means on at least three of the four sides of well 25.

## CLAIMS

1. A machine for the automatic production of filter bags for infusion products such as tea and camomile, the machine comprising means for depositing successive pairs of discrete doses of the product side by side along a first web of filter paper while advancing the web generally horizontally, means for superimposing a second web of filter paper over the first web and for transversely and longitudinally sealing the webs to separately enclose each product dose in a filter bag, means for severing the superimposed webs longitudinally and transversely to separate the filter bags from one another, and means for stacking the separated bags side by side, the stacking means including a substantially vertical separator for maintaining the separation of the stacks and controllable retaining means for retaining the bags in a stack formation.

2. A machine according to Claim 1 in which the vertical separator comprises a plate provided at the top with a lateral projection.

3. A machine according to Claim 2 in which the lateral projection is tapered along its upper edge.

4. A machine according to any one of the preceding claims in which the controllable stack retaining means comprises a cantilevered element pivotable about a generally horizontal axis between a substantially vertical orientation and a substantially horizontal orientation.

5. A machine according to Claim 4 in which the cantilevered element is resilient.

6. A machine according to any one of the preceding claims further comprising means for clamping the stacks of filter bags while transferring the bags to a packaging machine.

7. A machine according to Claim 6 in which the clamping means include jaws having elastic buffer means for engaging the sides of the stacks.

8. A machine according to Claim 6 or Claim 7 as dependent on Claim 4 in which the cantilevered element is moved to its horizontal orientation overlying the stacks of bags during transfer of the bags to the clamping means.

9. A machine for the automatic production of filter bags for infusion products such as tea, camomile and similar where the filter bags are obtained from two webs of filter paper having the same width and comprising diverting means to divert said two webs along superimposed paths, of which one around a multidosing drum of the infusion product which deposits in succession several doses placed transversally side by side and distanced from each other on the same web advancing horizontally and above which the other web advances so as to pass jointly between two drawing sealing rollers contrarotating in parallel about the same horizontal axis for longitudinally and transversally sealing said two webs superimposed around each of said doses longitudinally and transversally side by side and distanced, cutting means in order to cut lengthwise said paired and sealed webs between the longitudinal rows of doses transversally side by side, cutting means in order to cut transversally the same webs paired and sealed so as to obtain filter bags transversally connected and side by side, stacking means in order to stack according to a predetermined number said filter bags transversally connected and side by side and clamping means suitable to receive the stacks obtained and transfer them into the packaging boxes, characterized in that said cutting means are provided with a continuous cutting edge and beneath the transverse cutting means, between the latter and the stacking means, are provided vertical separating and guiding means of the individual filter bags side by side and separated, retaining means with controlled action in order to hold and keep under control the stacks of individual filter bags side by side and separated during their transfer to the said clamping means that transfer said stacks into the packaging boxes, said clamping means presenting between their jaws elastic buffer means to maintain compact the stacks of individual filter bags side by side and separated during said transfer to the said packaging boxes.

10. A machine substantially as herein described

with reference to the accompanying drawings.

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