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HERSTELLUNG VON AUFGUSSBEUTELN

FABRICATION D'EMBALLAGES POUR INFUSIONS

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Description

The present invention is generally concerned with infusion packages such as tea and coffee bags and similar bags containing herbal or other infusions. In particular the invention relates to an apparatus for and a method of manufacturing infusion packages and to an infusion package made by such apparatus and method.

A known method and apparatus for producing infusion packages such as tea bags, comprises dosing discrete piles of infusion at spaced intervals onto a rapidly moving paper web, and sealing a second web over the first web to produce a two ply web having a plurality of discrete pockets containing infusion. The web is then severed by means of laterally and longitudinally orientated knives into individual packages, or pairs of packages separated by a serrated cut, for discharge or packing. Such a method enables continuous fabrication of infusion packages at a very high production rate which is essential for the cost-effective manufacture of e.g. tea bags for sale in the general market place.

As discussed above, in known apparatus of this type the packages are severed from the two ply web by knives and as a consequence the infusion packages are square or rectangular, the pocket spacings and web dimensions being such that the entire web is cut into the individual packages or package pairs without leaving any waste web. Reciprocating punch and die cutting systems which are capable of being adapted to fabricate non-rectangular packages cannot operate sufficiently quickly to provide the high speed mass production rates commonly required for these products. For these reasons, infusion packages such as tea and coffee bags which have been mass produced at high production rates for sale on the general market have traditionally been rectangular.

From GB-A-674,886 is known an apparatus according to the first part of claim 1. In this system, rollers for sealing a non-porous backing layer to the packages are optionally provided with transverse cutting blades for severing a single lane web into individual rectangular packages.

Viewed from a first aspect, the invention provides apparatus for manufacturing infusion packages, comprising means for dosing infusion in discrete piles onto a first moving web, means synchronised with the dosing means for sealing a second moving web in relation to said first web to produce a travelling two ply web having a plurality of discrete pockets containing infusion, and a web cutting device comprising cooperating co-rotating rollers having a plurality of recess means which accommodate a plurality of successive infusion filled pockets during each complete rotation of the rollers, and cutting means provided on at least one of the rollers and associated with each said recess means for cutting out each said pocket into an individual package, characterised in that the cutting means associated with each recess means comprises a cutting edge which defines a non-

rectangular shape for the entire outer peripheral edge of each package, whereby in use waste web surrounds each package formed by the cutting device, the apparatus further comprising means for guiding the web in a generally horizontal direction downstream of the cutting device and for holding the web taut whereby the waste web surrounding the cut out packages is effective to transport the packages horizontally to a package removal means located downstream of the cutting device, a package stacking means being arranged beneath the package removal means, and the package removal means being operable to move successive packages from the web and downwards into the stacking means so that they are immediately stacked one above the other in a generally horizontal orientation, means being provided for collecting the waste web after the packages have been removed therefrom.

Viewed from a second aspect, the invention provides a method of manufacturing infusion packages comprising the steps of dosing infusion in discrete piles between first and second moving web portions, sealing the web portions together to produce a travelling two ply web having a plurality of discrete pockets containing infusion, passing the web through a roller cutting device having co-operating co-rotating rollers with a plurality of recess means which accommodate a plurality of successive infusion filled pockets during each complete rotation of the rollers, and cutting out each said pocket into a package by cutting means provided on at least one of the rollers, characterised by cutting out the packages by cutting means in the form of cutting edges which define a non-rectangular shape for the entire outer peripheral edge of each package whereby waste web surrounds each package formed by the cutting means, removing the cut out packages from the two ply web, and collecting the waste web after the packages have been removed, the method being further characterised in that the web is held taut downstream of the cutting device so that the waste web surrounding the packages is effective to transport the packages to the position where they are removed from the web, and in that the waste web and packages transported thereby travel horizontally from the cutting device to the position where the packages are removed from the web, the packages then being transferred downwards into stacking means wherein the individual infusion packages are immediately stacked one on top of the other in a generally horizontal orientation prior to being packaged.

Such an apparatus and method represents a completely new departure from the prior art in that, whilst a continuous high speed production rate may be maintained, infusion packages such as tea bags can be provided with shapes other than rectilinear. The presently preferred packages are substantially round, and a preferred embodiment of the invention has enabled for the first time manufacture of substantially round tea bags at a cost-effective high production rate for sale on the general market place, such tea bags being attractive to the

consumer.

To maximise production rate, the rollers preferably have a plurality of recesses and corresponding cutting means arranged both circumferentially and in the width direction. This allows a substantial number of packages to be produced per revolution of the rollers. The number of cutting means may vary, e.g. 2 to 10 around the circumference and 1 to 5 across the width of a roller.

In one embodiment the recess means comprises recesses formed on both rollers, and the relative angular orientation of the rollers is such that the or each recess pair on the respective rollers co-operate to form together a recess for accommodating the pockets on the webs, as they pass between the rollers. It is also possible that recesses may be formed only on one of the rollers with the other roller being plain.

It is envisaged that the rollers could act as a rotating punch and die, with cutting edges on both rollers forming a cutting action. Alternatively, a cutting edge on one roller could bear on a resilient surface of the other. Preferably, however, the cutting means is formed by a lip or ridge raised around the recess of one of the rollers (the cutting roller), the lip or ridge co-operating with a hard smooth surface of the opposed roller (anvil roller). The lip or ridge defines the predetermined shape of the packages. Preferably the smooth surface is provided around a recess on the anvil roller.

In a preferred embodiment the sealing means comprises co-rotating heated rollers through which the webs are passed and which, as with known machines of this type, include raised areas which define the seal areas, the webs including suitable thermoplastic materials for heat sealing. In accordance with the invention the raised areas preferably define a seal shape which matches the predetermined shape of the packages e.g. round. It is envisaged that the sealing means may be combined with the web cutting device by providing the cutting rollers with heating means and raised seals adjacent the cutting means. Clearly, this would provide excellent registration between the cut and the seal. However, a potential drawback with this approach is that the heating of the rollers could be detrimental to the cutting edge of the cutting means which must be high quality to cut material cleanly.

Preferably, therefore, the cutting rollers and sealing rollers are separate and are synchronised with each other to ensure that the sealed pockets produced by the sealing rollers engage correctly with the cutting rollers so that the cutting may be performed only on the sealed portions of the web leaving a continuously sealed area around the perimeter of the package of predetermined width and controlled tolerance. To this end, the sealing and cutting rollers have synchronised speeds, with the phase and relative lateral position of the cutting rollers preferably being adjustable with respect to the sealing rollers. As discussed, the seal produced between the webs preferably matches the shape of the final packages. Thus, for circular packages, a circular seal prefer-

ably surrounds each pocket of infusion.

As discussed above, with known techniques for producing rectilinear packages, the whole of the two ply web is effectively converted into packages and no waste web is produced. In accordance with the invention, on the other hand, web remaining after the packages have been severed is collected so that the integrity of the web may be maintained before and after the cutting operation. In a particularly advantageous embodiment, the means for collecting the remaining web is effective to maintain a degree of tension in the web downstream of the cutting device whereby the web (which will become waste) surrounding the cut out packages is effective to transport the packages to the package removing means. A particularly preferred collecting means comprises a suction system which is advantageously adjustable to provide desired tensioning of the web downstream of the cutting device and which may include a slot like inlet end for receiving the moving web communicating with a conduit for waste removal. A roller system has been proposed in place of a suction system.

In a preferred embodiment, the package removing means comprises a reciprocating stamping member or members whose movement is synchronised with the movement of the cutting device, the member or members urging the packages from the moving web, preferably downwardly into a stacking chamber arranged below. From the stacking chamber, the packages may be transferred automatically to cartons or boxes. The lower ends of the stamping members which engage the packages are preferably of smaller cross-section than the packages so that the members do not foul on the web material surrounding the packages as the packages are stamped from the web. The two ply web preferably is supported by platforms upstream and downstream of the cutting device, the downstream platform being apertured or interrupted beneath the package removing means to permit downward displacement of packages from the moving tensioned web downstream of the cutting device. The use of a downstream web support platform itself represents a completely new departure from known apparatus in which all of the web is cut into packages and therefore no web support has been provided downstream of the cutters.

The dosing means for the infusion may comprise a dosing roller synchronised with the sealing rollers of the preferred embodiment in a known manner.

The invention extends to an infusion package, such as a substantially round tea or coffee bag, made by the aforesaid method and apparatus.

The preferred web collection system discussed above itself represents a completely new departure from the prior art in the context of infusion package manufacture.

A preferred embodiment of the invention, for manufacturing circular tea bags, will now be described, by way of example only, with reference to the accompany-

ing drawings wherein:

Figure 1 shows, schematically, in side elevation, apparatus in accordance with the invention;
 Figures 2 is a schematic perspective view of the apparatus with certain parts removed for clarity;
 Figure 3 is a view similar to Figure 2 but showing other components of the preferred embodiment; and
 Figure 4 shows in front elevation the cutting rollers of Figure 3.

With reference to Figure 1, a web 4 of heat sealable filter paper is fed around a roller 6 of a dosing device (of known type) which deposits discrete piles of tea 7 on the moving web. Web 4 and a second moving filter web 5 are then brought together and pass through the nip of heated co-rotating sealing rollers 8, driven in synchronisation with roller 6, which join the strips together to form a two ply web 9 having discrete sealed pockets 3 containing tea. This general arrangement is known in the art and will not accordingly be discussed in more detail here.

Figure 3 shows the heated rollers 8 suitable for use in the present embodiment for producing substantially circular tea bags. Each roller 8 is provided with two rows of substantially circular pockets 10 arranged at equi-spaced intervals around the periphery of the roller. Of course, other numbers or arrangements of pockets would be quite possible. The rollers are rotatably carried by suitable bearing means (not shown) and driven via an intermeshing sprocket arrangement 11. In operation, as the rollers rotate, the raised portions 12 surrounding the pockets 10 pinch the webs 4 and 5 together and by virtue of their heat melt a sealing material, for example polypropylene, provided on the webs to form a two ply web having a plurality of discrete sealed pockets 3 containing tea. The operation of the sealing rollers is synchronised (in a known manner) with that of the dosing device 6 so that the tea doses deposited on the web 4 are surrounded by the pockets 10 during the heat sealing.

After the consolidated two ply web 9 leaves the sealing means 8, it passes to a cutting device 13, which will be described in more detail later. The cutting device 13 cuts substantially circular bags from the web 9 which will however still surround the bags after they leave the cutting device 13. The bags are transported by the web in this manner to a stacking and packing station 14, which will be described in greater detail later in the specification. When the bags have been separated from the web, the waste web material is removed by a suction device 15.

Returning now to the cutting device 13, this is shown in greater detail in Figures 2, 3 and 4. The cutting device comprises two co-operating, co-rotatable rollers 16, 17. The web 9 is fed into the pinch between the rollers along an entry platform 18.

The roller 17 is supported on a bearing which locates in vertical slots (not shown) running down the length of the opposed limbs 26, 29 of a support housing 30, with the upper roller 17 resting on the lower roller 16 which is carried by a fixed bearing. A clamp plate 31 is connected across the top of the limbs 28, 29 and mounts a threaded bolt 32 in a threaded bore. This bolt 32 acts via a pressure roller assembly 34 on the cutting rollers 16, 17, so that the contact pressure between the rollers 16, 17 may be raised or lowered by either tightening or loosening the bolt 32. The pressure roller assembly comprises rollers 61 at each end which act on the outer portions 62 of the cutting roller 17.

The design of the rollers 16, 17 can be clearly seen from Figure 4. Both rollers 16, 17 have a plurality of recesses 35, 36 formed in their respective surfaces, in two rows, the recesses in each row being equi-spaced around the respective roller circumference. The recesses are substantially circular in shape and are of approximately the same maximum depth but of somewhat different cross-section. They could be of different depths or shapes depending on the particular shape of bag being produced. The recesses 35 on the upper roller 17 are of greater area than those 36 on the lower roller 16 and will thus completely overlie those recesses as the rollers rotate and co-operate. They could instead be of the same area or smaller than those on the lower roller without changing the operational principles. The recesses 35, 36 co-operate to provide spaces for accommodating the tea containing portions of the pockets formed in the web 3. As described in the introduction, the number of recesses can vary. The illustrated cutting and sealing rollers are of similar diameter, but these may be different with the relative rotation speeds adjusted accordingly.

A substantially circular cutting edge 37 is formed around each recess 35 on the upper roller which therefore acts as a cutting roller. This edge 37 is constituted by a relatively low and narrow raised lip running around the recess. The top of the lip is sufficiently sharp to provide the desired cutting effect as a result of the pressure acting on the lip during cutting by virtue of the contact pressure set by the adjusting bolt 32. The cutting edges 37 bear against the smooth surface around the recesses 36 of the lower roller 16 which effectively acts as a rotating anvil. With exactly circular cutting edges the resultant bags may be very slightly elliptical as a result of stretching of the web as it passes through the cutting rollers. This may not be readily noticeable, but could be compensated for by making the cutting edges slightly elliptical if desired.

In the cutting operation, the web 9 having discrete sealed pockets containing tea passes successively between the rollers 16, 17. The cutting edge 37 acts with the anvil surface on roller 16 to cut out the bag, the space formed between the respective recesses 35 and 36 accommodating the tea containing portion of the bag, as it is cut.

To ensure satisfactory operation, the speed of rotation of the rollers 16, 17 is linked to that of the sealing rollers 8 by suitable gearing mechanism 38 shown schematically in Figure 3. The position of the cutting rollers 16, 17 is variable laterally with respect to the sealing rollers 8. To this end, an adjustment wheel 70 is threadedly engaged in housing arm 28. When the wheel 70 is screwed in or out, the roller 17 moves laterally in the housing 30. The relative phase of the sealing rollers 8 and cutting rollers 16, 17 may be adjusted by means of a clamping screw in slot arrangement 39 which releasably interengages a pair of intermediate sprockets 40, 41 meshing with the drive sprockets for the respective sets of rollers.

By proper setting of the relative lateral position and phase of the cutting rollers, the tea containing pockets on the web 9 will enter the cutting device correctly with the tea bearing portions accommodated within the recesses 35, 36 of the rollers 16, 17 and the sealed portions extending outwardly thereof to be cut by the cutting edge 37.

After the web 9 has been cut into individual bags, the bags are carried out of the cutting device 13 both by the momentum imparted by the cutting rollers 16, 17 and by the waste web material which still surrounds the bags and is placed in tension by the suction device 15.

After leaving the cutting means, the bags pass to the stacking station 14. This comprises stacking chambers 49 arranged side by side and open at their tops. The web in this region is supported by a further platform 48 which is apertured above the stacking chambers. As the bags pass over the tops of the chambers, they are pushed into the chambers by stamper members 50. These members, which are preferably circular in section and of smaller diameter than the tea bags, are mounted on the end of shafts 51 which reciprocate up and down. If other shaped bags are produced the section of the members preferably matches the bag shape. When a predetermined number of bags have entered the chambers 49, the stacks then are released from the bottom of the stacker into boxes (not shown). As shown in Figure 3, the upper ends of the shafts 51 of the stamper members 50 are resiliently engaged with rotating cam members 63 carried by cam shaft 64 which is coupled to the drive sprocket mechanism 38 via chain drive 65 which engages with a sprocket wheel 66 mounted on the drive shaft of the upper cutting roller 17. In this way the reciprocal movement of the stampers may be synchronised with the rotation of the cutting rollers. Power drive to the system can be imparted via any one of the drive sprockets of the mechanism 38.

Immediately after the stacking station is a waste web removal device 15. This comprises a conduit 54, which tapers to a slot like open mouth 55 at one end, extending across the web travel path and which communicates with a suction device (not shown) at the other end. This allows for an easy and effective removal of waste from the apparatus and, moreover, maintains the

tension in the web downstream of the cutting device to provide transport means for the cut out packages as described above.

The preferred embodiment can achieve a high production rate of bags, for example 1,200 to 2,500 per minute for the "two lane" web illustrated. The rollers are all rotated at high speeds, which may vary depending on roller sizes which can also vary. Speeds in the range of 200 to 500 rpm have been used in practice.

While the invention has been described with reference to production of substantially circular tea bags, it is of course applicable to other infusion packages and other shapes. Also, while the above embodiment describes cutting rollers which are each formed with recesses and which are driven together by intermeshed gearing, it will be appreciated that in another embodiment, recesses could be formed only on the cutting roller 17 with the roller 16 being plain. In such a case it is possible to dispense with the gearing between the rollers 16, 17 and to allow the roller 16 to be driven by friction.

Claims

1. Apparatus for manufacturing infusion packages, comprising means (6) for dosing infusion in discrete piles (7) onto a first moving web (4), means (8) synchronised with the dosing means for sealing a second moving web (5) in relation to said first web to produce a travelling two ply web (9) having a plurality of discrete pockets (3) containing infusion, and a web cutting device (13) comprising cooperating co-rotating rollers (16, 17) having a plurality of recess means (35, 36) which accommodate a plurality of successive infusion filled pockets during each complete rotation of the rollers, and cutting means (37) provided on at least one of the rollers and associated with each said recess means for cutting out each said pocket into an individual package, characterised in that the cutting means associated with each recess means comprises a cutting edge (37) which defines a non-rectangular shape for the entire outer peripheral edge of each package, whereby in use waste web surrounds each package formed by the cutting device, the apparatus further comprising means (15, 18) for guiding the web in a generally horizontal direction downstream of the cutting device and for holding the web taut whereby the waste web surrounding the cut out packages is effective to transport the packages horizontally to a package removal means (50, 51) located downstream of the cutting device, a package stacking means (49) being arranged beneath the package removal means, and the package removal means (50, 51) being operable to move successive packages from the web and downwards into the stacking means so that they are immediately stacked one above the other in a generally horizontal orienta-

tion, means being provided for collecting the waste web after the packages have been removed therefrom.

2. Apparatus as claimed in claim 1 in which the recess means comprises recesses (35,36) provided on both rollers. 5
3. Apparatus as claimed in claim 1 in which the recess means comprises recesses provided on only one of said rollers. 10
4. Apparatus as claimed in claim 1, 2 or 3 in which the cutting edge (37) is formed by a raised ridge or lip extending around the recess of one of the rollers and cooperating with a hard smooth surface of the opposed roller, the rollers being urged together so that the cooperation between the cutting edge and surface is under pressure. 15
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5. Apparatus as claimed in any preceding claim wherein the sealing means comprises co-rotating heated rollers (8) separate from and synchronised with the cutting rollers. 25
6. Apparatus as claimed in any preceding claim wherein the waste web collecting means comprises a suction system (15) having an inlet aperture (55) configured to receive the waste web material. 30
7. Apparatus as claimed in claim 6 wherein the suction system is effective to maintain a degree of tension in the web downstream of the cutting device.
8. Apparatus as claimed in any of claims 1 to 6 comprising a roller system for maintaining a degree of tension in the web downstream of the cutting device. 35
9. Apparatus as claimed in any preceding claim wherein the package removing means comprises a reciprocating stamping member or members (51) whose movement is synchronised with the movement of the cutting device, the member or members urging the packages downwardly from the moving web. 40
45
10. Apparatus as claimed in claim 9 wherein the lower end (50) of the member or members (51) are of smaller cross-section than the packages. 50
11. Apparatus as claimed in any preceding claim wherein the web is guided by a platform (18) between the cutting device and collecting means, the platform being interrupted or apertured beneath the package removal means. 55
12. A method of manufacturing infusion packages,

comprising the steps of dosing infusion in discrete piles (7) between first and second moving web portions (4,5), sealing the web portions together to produce a travelling two ply web (9) having a plurality of discrete pockets (3) containing infusion, passing the web through a roller cutting device (13) having co-operating co-rotating rollers (16,17) with a plurality of recess means (35,36) which accommodate a plurality of successive infusion filled pockets during each complete rotation of the rollers, and cutting out each said pocket into a package by cutting means (37) provided on at least one of the rollers, characterised by cutting out the packages by cutting means in the form of cutting edges (37) which define a non-rectangular shape for the entire outer peripheral edge of each package whereby waste web surrounds each package formed by the cutting means, removing the cut out packages from the two ply web, and collecting the waste web after the packages have been removed, the method being further characterised in that the web is held taut downstream of the cutting device so that the waste web surrounding the packages is effective to transport the packages to the position where they are removed from the web, and in that the waste web and packages transported thereby travel horizontally from the cutting device to the position where the packages are removed from the web, the packages then being transferred downwards into stacking means (49) wherein the individual infusion packages are immediately stacked one on top of the other in a generally horizontal orientation prior to being packaged.

Patentansprüche

1. Vorrichtung zum Herstellen von Aufgußpackungen, umfassend: Mittel (6) zum dosierten Aufbringen von Aufgußmaterial in getrennten Haufen (7) auf eine erste bewegliche Bahn (4), mit dem Dosiermittel synchronisierte Mittel (8) zum dichten Zusammenbringen einer zweiten beweglichen Bahn (5) mit der ersten Bahn, um eine fortlaufende zweilagige Bahn (9) mit mehreren getrennten, Aufgußmaterial enthaltenden Taschen herzustellen, und eine Bahnschneideeinrichtung (13), umfassend: zusammenwirkende gemeinsam drehende Rollen (16, 17) mit mehreren Ausnehmungsmitteln (35, 36), die während jeder vollständigen Drehung der Rollen mehrere aufeinanderfolgende, mit Aufgußmaterial gefüllte Taschen aufnehmen, und Schneidmittel (37), die an wenigstens einer der Rollen vorgesehen und jedem der Ausnehmungsmittel zugeordnet sind, um jede Tasche in eine Einzelpackung zu schneiden, **dadurch gekennzeichnet,** daß das jedem Ausnehmungsmittel zugeordnete Schneidmittel eine Schneidkante (37) umfaßt, die

eine nicht rechteckige Form für den gesamten Außenumfangsrand jeder Packung festlegt, wodurch bei Verwendung Abfallbahnmaterial jede durch die Schneideinrichtung gebildete Packung umgibt,

welche Vorrichtung weiter umfaßt: Mittel (15, 18) zum Führen der Bahn in einer im wesentlichen horizontalen Richtung stromabwärts der Schneideinrichtung und zum straffen Halten der Bahn, wodurch das die ausgeschnittenen Packungen umgebende Abfallbahnmaterial bewirkt, daß die Packungen horizontal zu einem Packungsentfernungsmittel (50, 51) gefördert werden, das stromabwärts der Schneideinrichtung angeordnet ist, ein Packungsstapelmittel (49), das unter dem Packungsentfernungsmittel angeordnet ist, und wobei das Packungsentfernungsmittel (50, 51) betätigbar ist, um aufeinanderfolgende Packungen von der Bahn und nach unten in das Stapelmittel zu bewegen, so daß sie unmittelbar eine über der anderen in einer im wesentlichen horizontalen Orientierung gestapelt werden, und wobei Mittel vorgesehen sind, um das Abfallbahnmaterial nach Entfernung der Packungen davon zu sammeln.

2. Vorrichtung nach Anspruch 1, in der das Ausnehmungsmittel Ausnehmungen (35, 36) umfaßt, die an beiden Rollen vorgesehen sind.

3. Vorrichtung nach Anspruch 1, in der das Ausnehmungsmittel Ausnehmungen umfaßt, die an nur einer der Rollen vorgesehen sind.

4. Vorrichtung nach Anspruch 1, 2 oder 3, in der die Schneidkante (37) durch eine hochstehende Kante oder Lippe gebildet ist, die um die Ausnehmung einer der Rollen herum verläuft und mit einer harten glatten Fläche der gegenüberliegenden Rolle zusammenwirkt, wobei die Rollen zusammengedrückt werden, so daß die Zusammenwirkung zwischen der Schneidkante und der Fläche unter Druck stattfindet.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, in der das Dichtmittel gemeinsam drehende erwärmte Rollen (8) umfaßt, die von den Schneidrollen getrennt und mit diesen synchronisiert sind.

6. Vorrichtung nach einem der vorhergehenden Ansprüche, in der das Sammelmittel für Abfallbahnmaterial ein Saugsystem (15) umfaßt, das eine zur Aufnahme von Abfallbahnmaterial geformte Einlaßöffnung (55) hat.

7. Vorrichtung nach Anspruch 6, in der das Saugsystem zur Einhaltung eines Spannungsgrads in der Bahn stromabwärts der Schneidvorrichtung wirk-

sam ist.

8. Vorrichtung nach einem der Ansprüche 1 bis 6, die ein Rollensystem umfaßt, um einen Spannungsgrad in der Bahn stromabwärts der Schneidvorrichtung zu halten.

9. Vorrichtung nach einem der vorhergehenden Ansprüche, in der das Packungsentfernungsmittel wenigstens ein hin- und hergehendes Stempelteil (51) umfaßt, dessen Bewegung mit der Bewegung der Schneidvorrichtung synchronisiert ist, wobei das wenigstens eine Teil die Packungen von der bewegenden Bahn nach unten drückt.

10. Vorrichtung nach Anspruch 9, in der das untere Ende (50) des wenigstens einen Teils (51) einen kleineren Querschnitt als die Packung hat.

11. Vorrichtung nach einem der vorhergehenden Ansprüche, in der die Bahn zwischen der Schneidvorrichtung und dem Sammelmittel mittels einer Plattform (18) geführt ist, welche Plattform unter dem Packungsentfernungsmittel unterbrochen ist oder eine Öffnung aufweist.

12. Verfahren zur Herstellung von Aufgußpackungen, das die Schritte umfaßt: dosiertes Aufbringen von Aufgußmaterial in getrennten Haufen (7) zwischen ersten und zweiten beweglichen Bahnabschnitten (4, 5), dichtes Zusammenbringen der Bahnabschnitte zur Erzeugung einer fortlaufenden zweilagigen Bahn (9) mit mehreren getrennten, Aufgußmaterial enthaltenden Taschen (3), Durchlaufen der Bahn durch eine Rollenschneideinrichtung (13) mit zusammenwirkenden gemeinsam drehenden Rollen (16, 17) mit mehreren Ausnehmungsmitteln (35, 36), die während jeder vollständigen Drehung der Rollen mehrere aufeinanderfolgende, mit Aufgußmaterial gefüllte Taschen aufnehmen, und Ausschneiden jeder Tasche in eine Packung durch Schneidmittel (37), die an wenigstens einer der Rollen vorgesehen sind,

gekennzeichnet durch

Ausschneiden der Packungen durch Schneidmittel in Form von Schneidkanten (37), die eine nicht rechteckige Form für den gesamten Außenumfangsrand jeder Packung festlegen, wodurch Abfallbahnmaterial jede durch das Schneidmittel gebildete Packung umgibt, Entfernen der ausgeschnittenen Packungen von der zweilagigen Bahn, und Sammeln des Abfallbahnmaterials nach Entfernen der Packungen, welches Verfahren weiter **dadurch gekennzeichnet**

ist, daß die Bahn stromabwärts der Schneideinrichtung straff gehalten ist, so daß das die Packungen umgebende Abfallbahnmaterial bewirkt, daß die

Packung zu der Position gefördert werden, wo sie von der Bahn entfernt werden, und daß das Abfallbahnmaterial und die Packungen so transportiert werden, daß sie von der Schneideinrichtung horizontal zu derjenigen Position laufen, in der die Packungen von der Bahn entfernt werden, wobei dann die Packungen nach unten in Stapelmittel (49) überführt werden, wo die einzelnen Aufgußpackungen unmittelbar eine auf der anderen in einer im wesentlichen horizontalen Orientierung vor deren Verpackung gestapelt werden.

Revendications

1. Appareil de fabrication de sachets pour infusion, comprenant un dispositif (6) destiné à doser la matière à infuser sous forme de tas séparés (7) sur une première feuille continue mobile (4), un dispositif (8) synchronisé sur le dispositif de dosage et destiné à sceller une seconde feuille continue mobile (5) sur la première feuille continue sous forme d'une feuille continue (9) à deux couches qui se déplace et qui a plusieurs pochettes séparées (3) contenant la matière à infuser, et un dispositif (13) de coupe de feuille continue comprenant des rouleaux coopérants (16, 17) tournant simultanément et ayant plusieurs cavités (35, 36) qui logent plusieurs pochettes successives remplies de matière à infuser à chaque tour complet des rouleaux, et un dispositif de coupe (37) placé sur l'un au moins des rouleaux et associé à chaque cavité afin qu'il découpe chaque pochette sous forme d'un sachet individuel, caractérisé en ce que le dispositif de coupe associé à chaque cavité comporte un bord de coupe (37) qui délimite une configuration non rectangulaire sur la totalité du bord périphérique externe de chaque sachet, de manière que, pendant l'utilisation, l'excès de feuille entoure chaque sachet formé par le dispositif de coupe, l'appareil comprenant en outre un dispositif (15, 18) destiné à guider la feuille continue en direction générale horizontale en aval du dispositif de coupe et à maintenir la feuille continue sous forme tendue de manière que les déchets de feuille entourant les sachets découpés assurent le transport des sachets horizontalement vers un dispositif (50, 51) d'extraction de sachets placés en aval du dispositif de coupe, un dispositif (49) d'empilement de sachets étant placé au-dessous du dispositif d'extraction de sachets et le dispositif (50, 51) d'extraction de sachets étant destiné à déplacer les sachets successifs de la feuille continue vers le bas vers le dispositif d'empilement de manière que les sachets soient immédiatement empilés les uns au-dessus des autres avec une orientation générale horizontale, et un dispositif destiné à collecter l'excès de feuille continue après que les sachets ont été retirés de celle-ci.
2. Appareil selon la revendication 1, dans lequel les cavités comprennent des cavités (35, 36) formées sur les deux rouleaux.
3. Appareil selon la revendication 1, dans lequel les cavités comprennent des cavités formées sur un seul des rouleaux.
4. Appareil selon les revendications 1, 2 ou 3, dans lequel le bord de coupe (37) est formé par une lèvre ou nervure en saillie disposée autour de la cavité de l'un des rouleaux et coopérant avec une surface lisse et dure du rouleau opposé, des rouleaux étant repoussés l'un vers l'autre de manière que le bord de coupe et la surface coopèrent sous pression.
5. Appareil selon l'une quelconque des revendications précédentes, dans lequel le dispositif de scellement comporte des rouleaux chauffants (8) tournant ensemble, séparés des rouleaux de coupe et synchronisés sur ces derniers.
6. Appareil selon l'une quelconque des revendications précédentes, dans lequel le dispositif destiné à collecter l'excès de feuille continue comporte un ensemble d'aspiration (15) ayant une ouverture d'entrée (55) dont la configuration permet le passage de l'excès de matière en feuille.
7. Appareil selon la revendication 6, dans lequel l'ensemble d'aspiration assure le maintien d'une tension convenable dans la feuille continue en aval du dispositif de coupe.
8. Appareil selon l'une quelconque des revendications 1 à 6, comprenant un ensemble à rouleaux destiné à maintenir une certaine tension dans la feuille en aval du dispositif de coupe.
9. Appareil selon l'une quelconque des revendications précédentes, dans lequel le dispositif d'extraction des sachets comporte un ou plusieurs organes alternatifs (51) d'estampage dont le mouvement est synchronisé sur celui du dispositif de coupe, l'organe ou les organes repoussant les sachets vers le bas sous la feuille continue mobile.
10. Appareil selon la revendication 9, dans lequel l'extrémité inférieure (50) de l'organe ou des organes (51) a une section inférieure à celle des sachets.
11. Appareil selon l'une quelconque des revendications précédentes, dans lequel la feuille continue est guidée par une plate-forme (18) entre le dispositif de coupe et le dispositif collecteur, la plate-forme étant discontinue ou ayant des ouvertures disposées au-dessous du dispositif d'extraction de sachets.

12. Procédé de fabrication de sachets de matière à infuser, comprenant les étapes suivantes : le dosage d'une matière à infuser en tas séparés (7) entre une première et une seconde partie (4, 5) de feuille continue mobile, le scellement des parties de 5
feuille mutuellement afin qu'elles forment une feuille continue mobile (9) à deux couches ayant plusieurs poches séparées (3) contenant la matière à infuser, la circulation de la feuille continue dans un dispositif (13) de coupe à rouleaux ayant des rouleaux coo- 10
pérants (16, 17) tournant ensemble et plusieurs cavités (35, 36) qui logent des poches successives remplies de la matière à infuser à chaque tour complet des rouleaux, et la découpe de chaque poche sous forme d'un sachet à l'aide d'un dispositif de 15
coupe (37) placé sur l'un au moins des rouleaux, caractérisé par la découpe des sachets à l'aide d'un dispositif de coupe sous forme de bords de coupe (37) qui délimitent une configuration non rectangu- 20
laire sur la totalité du bord périphérique externe de chaque sachet, d'une manière telle qu'un excès de feuille entoure chaque sachet formé par le dispositif de coupe, par l'extraction des sachets découpés dans la feuille à deux couches et par la collecte de l'excès de feuille continue après l'extraction des 25
sachets, le procédé étant en outre caractérisé en ce que la feuille continue est maintenue tendue en aval du dispositif de coupe afin que l'excès de feuille continue entourant les sachets assure le transport des sachets vers la position à laquelle ils 30
sont retirés de la feuille continue, et en ce que l'excès de feuille et les sachets transportés de cette manière se déplacent horizontalement du dispositif de coupe à la position à laquelle les sachets sont retirés de la feuille continue, les sachets étant alors 35
transférés vers le bas dans un dispositif d'empilement (49) dans lequel les sachets individuels de matière à infuser sont immédiatement empilés les uns sur les autres avec une orientation générale horizontale avant d'être conditionnés. 40

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FIG. 1

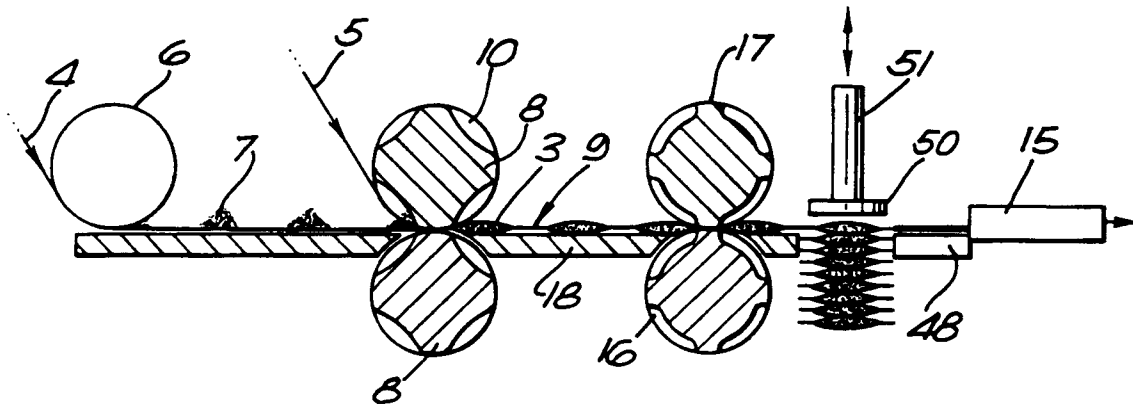


FIG. 4

