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(54) **METHOD TO MAKE A PACKAGE FOR FOODSTUFFS AND PACKAGE THUS OBTAINED**

VERFAHREN ZUR HERSTELLUNG EINER VERPACKUNG FÜR LEBENSMITTEL UND SO ERHALTENE VERPACKUNG

PROCEDE DE FABRICATION D'UN EMBALLAGE POUR ALIMENTS ET EMBALLAGE AINSI OBTENU

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(56) References cited:
EP-A- 0 844 191
CA-A1- 1 126 701
GB-A- 253 362
US-A- 2 735 797
US-A- 4 497 679

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a method to make a package usable for industrial, artisan and domestic preservation and packaging, of foodstuffs, fresh or otherwise, both of vegetable or animal origin, or any other type of food product which will quickly perish if not correctly preserved. To be more exact, the package according to the present invention, substantially in a single layer advantageously of the same material, has a central support zone for the foodstuffs, with which at least a fin, preferably two, is laterally associated, foldable over the central zone.

BACKGROUND OF THE INVENTION

[0002] It is known that the industrial, artisan and domestic making up and packaging of foodstuffs, for example but not only, sliced meats, cheeses, meats or suchlike, is done by means of packages normally consisting of two overlapping sheets, respectively a first outer sheet made of more consistent material, which acts as a support for the package, and a second inner sheet of material for food, thinner, disposed in contact with the food product, which guarantees a certain barrier against the air and other deteriorating agents in order to increase the time the product can be conserved.

[0003] The European patent EP-B-0,844,191 discloses a packaging element, or package, made of a double-layer composite material, in particular for food products.

[0004] This known package comprises a first outer layer consisting of a sheet of paper material, and a second inner layer, glued to the first and consisting of a film of plastic material hygienically suitable for the preservation of food products.

[0005] The packaging described in EP-B-0,844,191 provides that the second layer overlaps laterally from the first layer, thus defining a central support zone formed by the two overlapping layers, and glued together on a substantial part of the overlapping surface, and one or more lateral fins formed only by the second layer, which when the product is packed can be folded over the food product.

[0006] However, this known solution is not optimum for the preservation of the food products both because of the presence of the paper, which being porous can absorb dirt and bacteria, and also because of the presence of glues, which can deteriorate the organoleptic characteristics of the food products.

[0007] Moreover, the use of two layers of different material, and the need to glue them, entails difficulties both to make and also to dispose of and recycle the package, which must be done in a differentiated manner.

[0008] These disadvantages thus entail an increase both in the times and costs of production of the package, and also for its disposal after use.

[0009] Document US-A-4.497.679 describes a device and a method to make plastic envelopes closed on two adjacent sides, and obtained by cutting and welding performed, on two sheets advancing one above the other, consecutively in a longitudinal and transverse direction with respect to the direction of feed of the sheets; the envelopes, closed on two adjacent sides, are suitable to contain photographs or other small flat objects, but are not intended for packing food products. This document does not teach to make packages for foodstuffs comprising a central support zone for the food and two fins for covering and protecting the food, which start from the opposite lateral edges of said central zone and are open in correspondence with a zone comprised between said lateral edges.

[0010] Document US-A-2.735.797 describes a method to cut and weld in two steps two or more plastic sheets, overlapping and compressed one over the other, in which the cutting and welding takes place along a line transverse to the longitudinal development of the sheets. The welding is performed with an ample overlapping of the two sheets so that, when the transverse cut is made to separate two sheets welded together, each of the two separate sheets maintains a sufficiently resistant welded edge. This document also does not provide any teaching regarding packages for foodstuffs comprising a central part supporting the food and two covering fins that start from the opposite longitudinal sides of the central zone.

[0011] GB-A-253.362, on which the preamble of claim 6 is based, discloses a package of foodstuffs wherein one or more pieces of transparent material are attached to one or more edges of a paper sheet.

[0012] One purpose of the present invention is to perfect a method to make a package for preserving food products, made of a single plastic material, which does not entail the use of glues in order to associate the fins to the central support zone, and which guarantees an optimum preservation of the food products.

[0013] Another purpose of the present invention is to make a package for food products, having a central zone to support the food and two fins to cover and protect the food which start from opposite longitudinal edges of said central zone, which has relatively limited production times and costs, and which is completely recyclable.

[0014] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0015] The present invention is set forth and characterized in the main claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0016] In accordance with the above purpose, a package for foodstuffs according to the present invention is of the single-layer type and comprises at least a central

support zone for the food, and two lateral fins each of which extends from an opposite lateral edge of the central zone and which can be, at least during the packaging step, folded back over the central zone with the function of protecting and covering the food product.

[0017] According to a characteristic feature of the invention, the package comprises a first sheet of plastic material that defines the central zone, or support zone for the food product to be packed, and at least a second sheet of plastic material that defines the lateral fins. The lateral fins are only welded along the relative lateral edge to the central zone, substantially without reciprocal overlapping, **or at most with a minimum of reciprocal overlapping**, of the reciprocally welded zones.

[0018] With the present invention, it is thus possible to obtain a package with fins without needing any reciprocal overlapping of the two sheets, forming a package substantially with a single layer, and without needing to use glues, thus improving the quality of preservation of the foodstuffs.

[0019] Moreover, since both the sheets are of plastic material, they are easier to dispose of and recycle after use, since these operations do not need any separation steps to separate the materials, as happens with known packages made of paper and plastic.

[0020] Advantageously, the plastic material used to make the two sheets is a mixture of a polymer, for example a polyethylene or a polypropylene charged with calcium carbonate, and possibly with the addition of talc, sliding agents, anti-blockers, powdery or adsorbent inert materials, colored pigments, food additives with preserving and anti-oxidizing capacities, or other. In this way, each of the two sheets has good characteristics of consistency and resistance and a particular aesthetic appearance and feel, for example similar to paper.

[0021] In this way, the package made not only has optimum characteristics for preserving food, but also substantially keeps the fold conferred thereon by the user around the packaged food.

[0022] According to the invention, the method to make the package provides at least a first step of parallel feed of the first onto the second sheet of plastic material; and a second step of reciprocal trimming and welding of the first and second sheet along the respective lateral edges affected by the fin, so that the first sheet defines, as said, the central zone, while the second sheet defines the lateral fins.

[0023] Moreover, in a first embodiment the method also provides a third step in which only the second sheet is cut in a zone comprised between the two lateral edges, advantageously in proximity with its median zone, so that the cut parts define the two lateral edges. With this embodiment, the inner edges of the two fins remain at a slight distance from each other, without overlapping.

[0024] In a variant of the method, the fins are always obtained from at least a second sheet with a width greater than the width of the first sheet, and divided before being taken to overlap and be welded to the lateral edges of the first sheet. This is so that, after being welded to the respective opposite lateral edges of the first sheet, the inner edges of the fins overlap each other for a short segment, closing the slit which, in the previously illustrated embodiment, is formed between the two fins. According to a variant, the two fins are obtained from respective separate sheets which are brought near each other before coming into correspondence with the welding zone with the opposite lateral edges of the first sheet.

[0025] In both cases, after the definition of the fins, the method provides at least a step of transverse cutting to size and possible finishing.

[0026] In a preferential embodiment, the first sheet has a greater thickness with respect to the second sheet, so that the central zone performs the function of supporting the food with greater efficiency compared with fins that have mainly a covering and protective function.

[0027] This supporting function can be further reinforced, according to an improved variant, by embossing, ribs or other stiffening workings made at least on the outer surface of the first sheet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] These and other characteristics of the present invention will become apparent from the following description of some preferential forms of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1a is a plane view of a first form of embodiment of a package for foodstuffs according to the present invention;
- fig. 1b is a three-dimensional view of the package for foodstuffs in fig. 1 with fins open;
- fig. 2 is a block diagram of a method to make the package in figs. 1a and 1b;
- fig. 3 is a schematic view of a plant to make the package in figs. 1a and 1b, with the method shown schematically in fig. 2;
- fig. 4 is a plane view of a package according to the invention in a second form of embodiment;
- fig. 5 is a schematic view of a plant to make the package in fig. 4.

DETAILED DESCRIPTION OF SOME PREFERENTIAL FORMS OF EMBODIMENT

[0029] With reference to figs. 1a and 1b, a package 10a according to the present invention is usable for making up and packing foodstuffs, fresh or otherwise, both of vegetable and animal origin.

[0030] The package 10a is substantially of the single-layer type and comprises a first sheet 11 and a second sheet 12 welded to the first sheet 11 along both its lateral edges 13 and 14.

[0031] The first sheet 11 is substantially rectangular in shape, and defines a central support zone 15 of the pack-

age 10a on which the food products are disposed.

[0032] Moreover, the first sheet 11 is made of plastic material of the type used for food, has a thickness comprised in a range of values between about 20μm and about 100 μm, and on its outer surface there are advantageously embossed parts, ribs or suchlike, not shown, which allow the first sheet 11 to perform an effective supporting function and to maintain the fold around the packaged food product.

[0033] The second sheet 12 also has a rectangular shape, of a size substantially equivalent to that of the first sheet 11, and defines a pair of lateral fins 16 and 17 which can be selectively disposed between a position extending laterally to the central support zone 15 (fig. 1b) and a position folded over the central support zone 15 (fig. la), in order to cover the food products.

[0034] The second sheet 12 too is made of plastic material and has a lesser thickness than that of the first sheet, that is, comprised in a range of values between about 6 μm and about 40 μm.

[0035] Advantageously, the plastic material used to make the first sheet 11 and the second sheet 12 is of the type described in the application for an Italian patent IT-A-UD2005A000069 in the name of the present Applicant.

[0036] The plastic material consists of a mixture comprising a determinate polymer, for example polyethylene, polypropylene or other, charged with at least an additive component, such as for example calcium carbonate, suitable both to increase the consistency and resistance of the polymer, and also to provide it with a desired aesthetic appearance and feel, for example similar to paper, so that it can autonomously maintain the fold imparted to the sheets 11 and 12, and possibly have logos and identifying writings printed thereon.

[0037] The plastic mixture also comprises, in a known manner, components such as talc, sliding agents, antiblocks, powdery or adsorbent inert materials, colored pigments, food additives such as ascorbic acid, acetic acid, sorbic acid, propionic acid, lactic acid, acid or citric.

[0038] As shown schematically in fig. 2, the method to make the package 10a comprises the following steps:

- a first step of parallel feed of the second sheet 12 on the first sheet 11. For example, according to the plant shown schematically as an example in fig. 3, in this first step the two sheets are unrolled from respective coils 11a and 12a and passed through a slit defined between two transverse bars 19;
- a second step of trimming the lateral edges 13 and 14, with simultaneous reciprocal welding of the two sheets 11 and 12, along the edges 13 and 14, so that the lateral fins 16 and 17, which will be formed in the subsequent step, as we shall see, are welded substantially without any overlapping to the central zone 15;
- a third step of longitudinal cutting of the second sheet 12 only, at the center of a zone comprised between the two edges 13 and 14, and its partial lifting with respect to the central sheet 11, so that the two lateral fins 16 and 17 thus defined have substantially equivalent sizes.

[0039] In the embodiment shown in fig. 3, the first sheet 11 and the second sheet 12 are of a size such as to allow to simultaneously make three packages 10a at a time, and therefore four cutting and welding members 20 are provided, which trim and weld the sheets 11 and 12 along the lateral edges 13 and 14.

[0040] In the embodiment shown in fig. 3, three cutting and lifting feet 21 are also provided, which make the longitudinal cut on the second sheet 12, and slightly lift the lips cut so as to separate the fins 16 and 17 from the central zone 15.

[0041] In this case, a finishing step is also provided wherein, after the two fins 16 and 17 have been defined, the sheets 11 and 12 are cut transversely by a shears 22, so as to define the length of each package 10b.

[0042] The cut made with the shears 22 can be through, or it can define a series of holes in a line, which constitute a facilitated preferential cutting line.

[0043] Figs. 4 and 5 show another embodiment of the invention to form packages 10b in which the fins 16 and 17, after they have been attached to the central zone 15, form a central overlapping band, denoted generally by the number 23 (fig. 4), in order to improve the function of protecting the food during and after packaging.

[0044] In the description of figs. 4 and 5, the same reference numbers are used to indicate equal or equivalent parts described with reference to figs. 1-3.

[0045] In the plant shown in fig. 5, which forms four packages 10b, the fins are obtained from four different rolls 24 which feed respective sheets 25 of suitable size, but it comes within the field of the invention that the feed is derived from a single second sheet 12 suitably cut longitudinally to size before being coupled with the first sheet 11.

[0046] Each sheet 25, which when coupled with the first sheet 11 will form respective fins 16, 17, in this case has a width greater than half of the central zone 15. The, in the case shown here, four sheets 25 are coupled with the first sheet 11, and then welded and cut by the four cutting and welding members 20, both in correspondence with a substantially median zone thereof, so that one sheet 25 forms a fin 16 of a first package 10b and a fin 17 of a second adjacent package 10b. In this way it is possible to obtain that the fins 16 and 17, obtained from different starting sheets 25, slightly overlap so as to form the overlapping zone 23.

[0047] It is clear, however, that modifications and/or additions of parts or steps may be made to the package 10a, 10b and the relative method to make it as described heretofore, without departing from the scope of the present invention.

[0048] For example, it comes within the scope of the present invention to provide that the two fins 16 and 17 are welded to the central zone 15 along two contiguous,

not opposite edges.

[0049] It also comes within the scope of the present invention to provide that the cutting of the second sheet 12 to define the two fins can be made peripherally in the zone comprised between the two edges 13 and 14, so that the two fins 16 and 17 have different sizes, or a curvilinear development.

[0050] According to another variant, the first sheet 11 has a different color and/or level of transparency from the second sheet 12.

[0051] It is also clear that, although the present invention has been described with reference to specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of method to make a package for foodstuffs, and package thus obtained, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Method to make a package (10a) for foodstuffs comprising at least a central zone (15), functioning during use as a support for said foodstuffs, and two lateral fins (16, 17) each of which extends from a respective opposite lateral edge (13, 14) of said central zone (15), functioning during use as a protection for said foodstuffs, which method provides at least a first step of substantially parallel feed of a first (11) on at least a second (12) sheet of plastic material, a second step of reciprocal trimming and welding of said first (11) and said second (12) sheet at least along said lateral edges (13, 14), and a third step of cutting said second sheet (12) in a zone comprised between said two lateral edges (13, 14), so that the cut parts define two lateral fins (16, 17) welded along said opposite lateral edges of said central zone (15) with a minimum of reciprocal overlapping of the reciprocally trimmed and welded edges.

2. Method to make a package (10b) for foodstuffs comprising at least a central zone (15), functioning during use as a support for said foodstuffs, and two lateral fins (16, 17) each of which extends from a respective opposite lateral edge (13, 14) of said central zone (15), functioning during use as a protection for said foodstuffs, which method provides at least a first step of substantially parallel feed of a first (11) on at least a second (12, 25) sheet of plastic material, a second step of reciprocal trimming and welding of said first (11) and said second (12, 25) sheet at least along said lateral edges (13, 14), wherein said second sheet (12, 25) has a width greater than half of said central zone (15), and wherein said trimming and welding step takes place in a substantially median zone of said second sheet (12, 25) so that one of said second sheets (12, 25) forms a first fin (16) for one package (10b) and a second fin (17) for an adjacent package (10b), and wherein the reciprocal trimming and welding of the first (11) and second sheet (12, 25) takes place with a minimum of reciprocal overlapping, of the reciprocally trimmed and welded edges.

3. Method as in claim 1 or 2, **characterized in that**, after said two fins (16, 17) have been defined, it provides at least a step of transverse cutting to size and possible finishing.

4. Method as in any claim hereinbefore, **characterized in that** said first (11) and said second sheet (12, 25) are made of plastic material.

5. Method as in any claim hereinbefore, **characterized in that** said first sheet (11) has a greater thickness than said second sheet (12, 25).

Patentansprüche

1. Verfahren zum Herstellen von einer Verpackung (10a) für Nahrungsmittel, welche zumindest einen Mittenabschnitt (15), welcher während der Verwendung als eine Absteifung für die Nahrungsmittel dient, und zwei Seitenflügel (16, 17), wobei sich jeder davon von einer jeweils gegenüberliegenden Seitenkante (13, 14) von dem Mittenabschnitt (15) erstreckt, welche während der Verwendung als Schutz für die Nahrungsmittel dienen, enthält, wobei das Verfahren zumindest einen ersten Schritt eines im Wesentlichen parallelen Zuführens von einer ersten Bahn (11) auf zumindest eine zweite Bahn (12) aus einem Kunststoffmaterial, einen zweiten Schritt eines wechselseitigen Abschneidens und Verschmelzens von der ersten Bahn (11) und der zweiten Bahn (12), zumindest entlang der Seitenkanten (13, 14), und einen dritten Schritt eines Schneidens von der zweiten Bahn (12) in einem Abschnitt, welcher sich zwischen den zwei Seitenkanten (13, 14) befindet, so dass die geschnittenen Teile zwei Seitenflügel (16, 17) bestimmen, welche entlang der gegenüberliegenden Seitenkanten von dem Mittenabschnitt (15), bei minimaler wechselseitiger Überlappung der wechselseitig abgeschnittenen und verschmolzenen Kanten, verschmolzen sind, enthält.

2. Verfahren zum Herstellen von einer Verpackung (10b) für Nahrungsmittel, welche zumindest einen Mittenabschnitt (15), welcher während der Verwendung als eine Absteifung für die Nahrungsmittel dient, und zwei Seitenflügel (16, 17), wobei sich jeder davon von einer jeweils gegenüberliegenden Seitenkante (13, 14) von dem Mittenabschnitt (15) erstreckt, welche während der Verwendung als Schutz für die Nahrungsmittel dienen, enthält, wobei das

Verfahren zumindest einen ersten Schritt eines im Wesentlichen parallelen Zuführens von einer ersten Bahn (11) auf zumindest eine zweite Bahn (12, 25) aus einem Kunststoffmaterial, einen zweiten Schritt eines wechselseitigen Abschneidens und Verschmelzens von der ersten Bahn (11) und der zweiten Bahn (12, 25), zumindest entlang der Seitenkanten (13, 14), wobei die zweite Bahn (12, 25) eine Breite hat, welche größer als die Hälfte des Mittenabschnittes (15) ist, enthält, und wobei die Schritte zum Abgleichen und Verschmelzen in einem im Wesentlichen mittleren Abschnitt von der zweiten Bahn (12, 25) stattfinden, so dass eine von den zweiten Bahnen (12, 25) einen ersten Flügel (16) für eine Verpackung (10b) und einen zweiten Flügel (17) für eine angrenzende Verpackung (10b) ausbildet, und wobei das wechselseitige Abschneiden und Verschmelzen von der ersten Bahn (11) und der zweiten Bahn (12, 25) bei einer minimalen wechselseitigen Überlappung von den wechselseitig abgeschnittenen und verschmolzenen Kanten stattfinden.

3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** es, nachdem die zwei Seitenflügel (16, 17) bestimmt wurden, zumindest einen Schritt eines quer gerichteten Abschneidens zum Abmessen und möglichen Endfertigen bereitstellt.

4. Verfahren nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Bahn (11) und die zweite Bahn (12, 25) aus einem Kunststoffmaterial erstellt sind.

5. Verfahren nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die erste Bahn (11) eine größere Dicke als die zweite Bahn (12, 25) hat.

Revendications

1. Procédé de fabrication d'un emballage (10a) pour aliments comprenant au moins une zone centrale (15), qui fonctionne, pendant l'utilisation, comme un support pour lesdits aliments, et deux rabats latéraux (16, 17), dont chacun s'étend à partir d'un bord latéral opposé (13, 14) respectif de ladite zone centrale (15), qui fonctionnent, pendant l'utilisation, comme une protection pour lesdits aliments, lequel procédé prévoit au moins une première étape consistant sensiblement en l'alimentation parallèle d'une première (11) et au moins d'une seconde (12) feuille de matière plastique, une deuxième étape consistant en le dressage et le soudage réciproques de ladite première (11) et de ladite seconde (12) feuille au moins le long desdits bords latéraux (13, 14), et une troisième étape consistant en la découpe de ladite seconde feuille (12) dans une zone comprise entre lesdits deux bords latéraux (13, 14), de telle sorte que les parties découpées définissent deux rabats latéraux (16, 17) soudés le long desdits bords latéraux opposés de ladite zone centrale (15) avec un minimum de chevauchement réciproque des bords réciproquement dressés et soudés.

2. Procédé de fabrication d'un emballage (10a) pour aliments comprenant au moins une zone centrale (15), qui fonctionne, pendant l'utilisation, comme un support pour lesdits aliments, et deux rabats latéraux (16, 17), dont chacun s'étend à partir d'un bord latéral opposé (13, 14) respectif de ladite zone centrale (15), qui fonctionnent, pendant l'utilisation, comme une protection pour lesdits aliments, lequel procédé prévoit au moins une première étape consistant sensiblement en l'alimentation parallèle d'une première (11) et au moins d'une seconde (12) feuille de matière plastique, une deuxième étape consistant en le dressage et le soudage réciproques de ladite première (11) et de ladite seconde (12) feuille au moins le long desdits bords latéraux (13, 14), dans lequel ladite seconde feuille (12, 25) a une largeur supérieure à la moitié de ladite zone centrale (15), et dans lequel ladite étape de dressage et de soudage est effectuée dans une zone sensiblement médiane de ladite seconde feuille (12, 25), de telle sorte que l'une desdites secondes feuilles (12, 25) forme un premier rabat (16) pour un emballage (10b) et un second rabat (17) pour un emballage adjacent (10b), et dans lequel le dressage et le soudage réciproques de la première (11) et de la seconde (12, 25) feuille sont effectués avec un minimum de chevauchement réciproque des bords réciproquement dressés et soudés.

3. Procédé selon la revendication 1 ou 2, **caractérisé en ce que**, après que lesdits deux rabats (16, 17) ont été définis, il prévoit au moins une étape de découpe transversale aux dimensions et une éventuelle finition.

4. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ladite première feuille (11) et ladite seconde feuille (12, 25) sont constituées de matière plastique.

5. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ladite première feuille (11) a une épaisseur plus grande que ladite seconde feuille (12, 25).

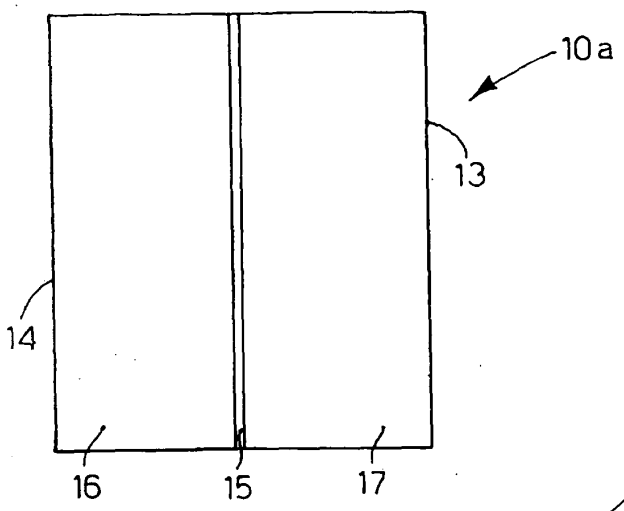


fig.1a

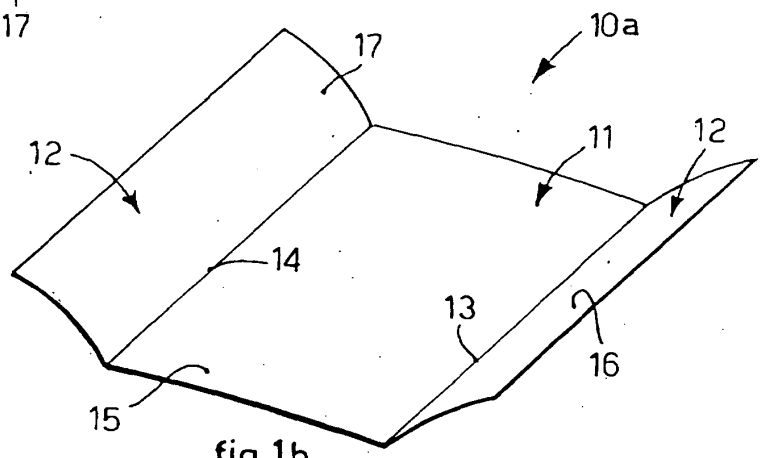


fig.1b

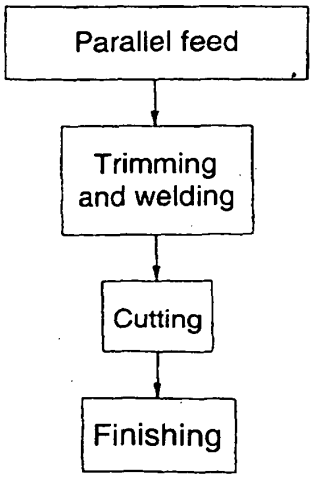


fig. 2

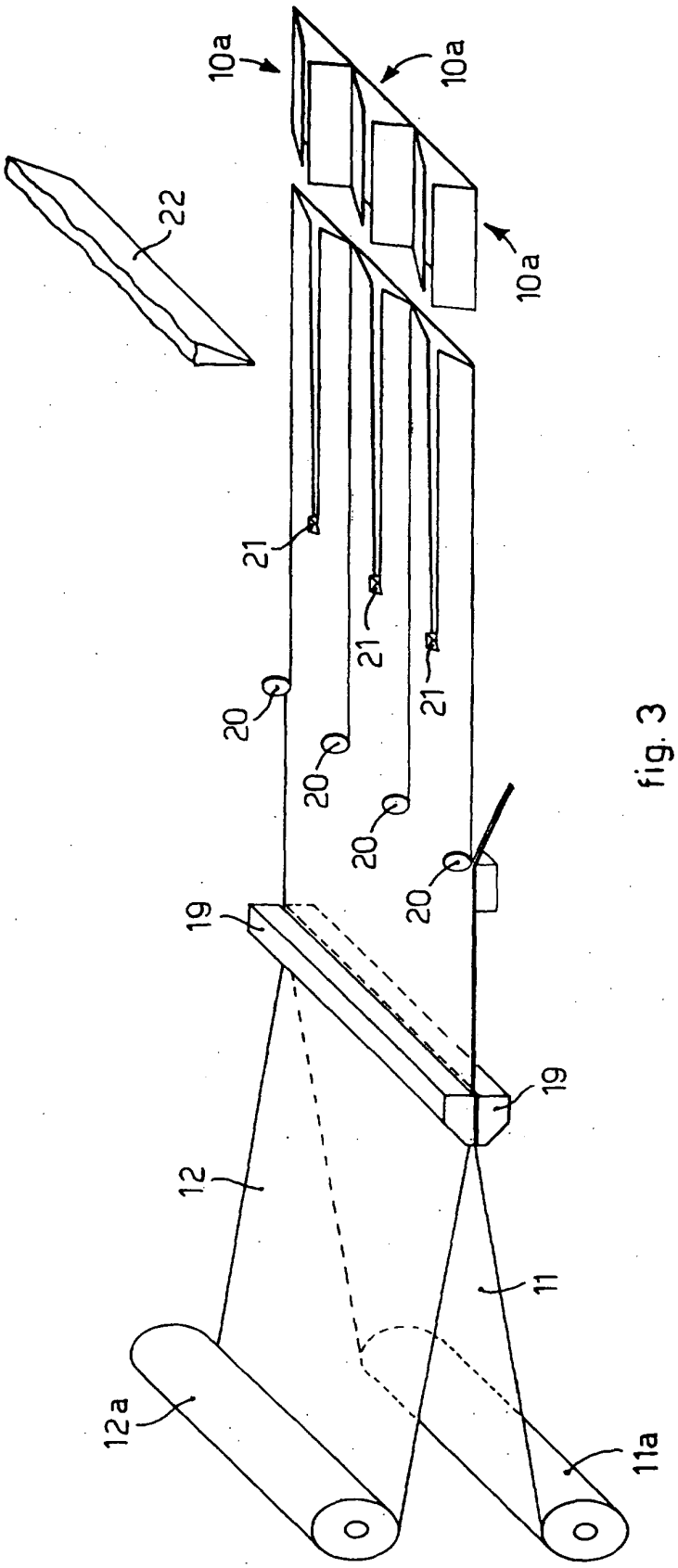


fig. 3

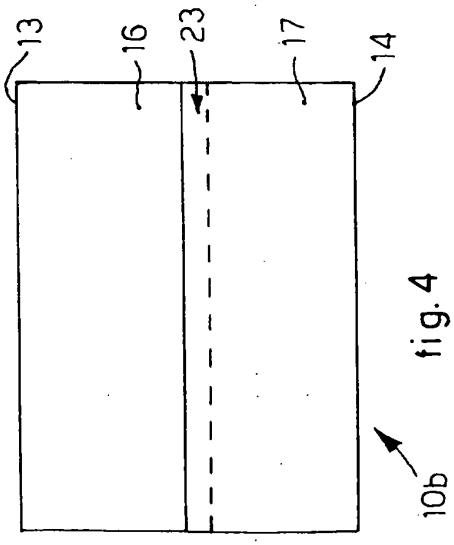

13
16
23
17
14
10b

fig. 4

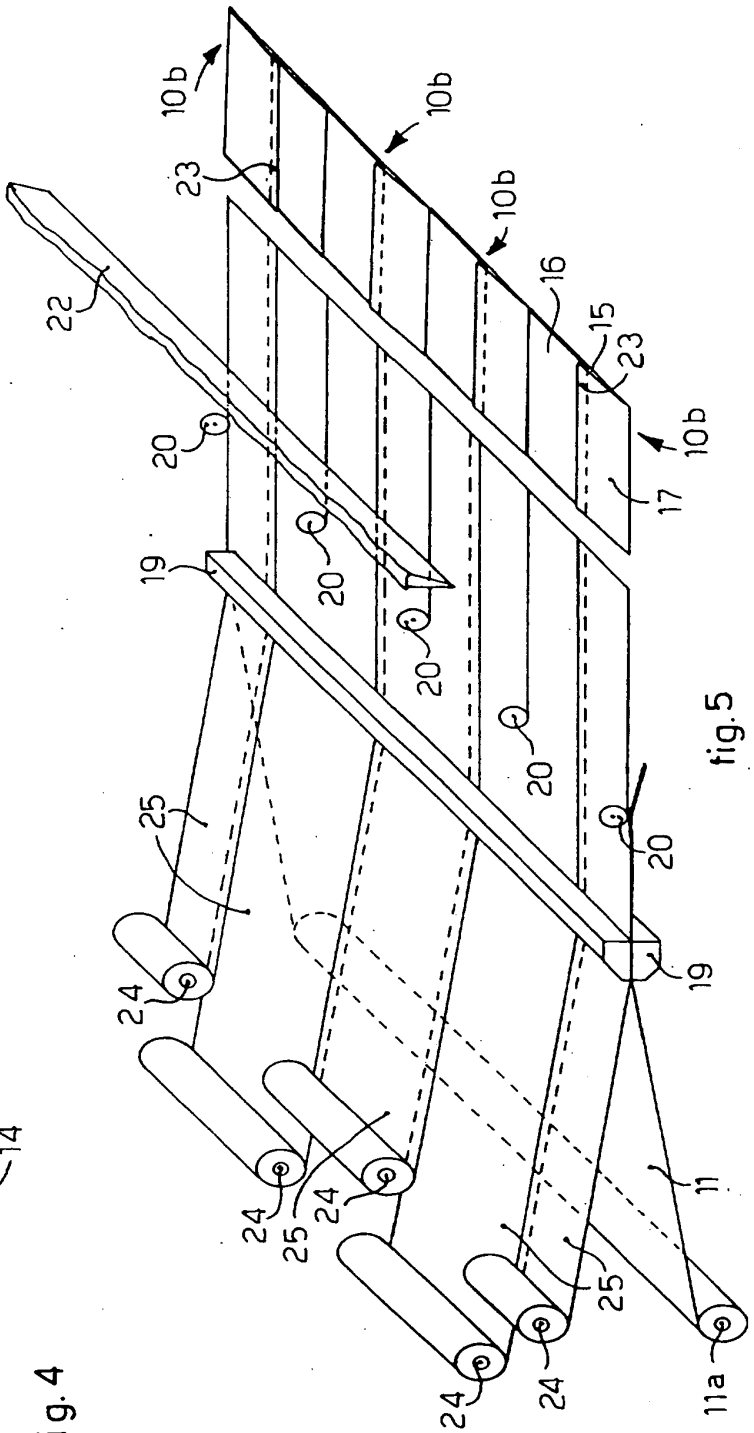

10b
10b
10b
23
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0844191 B **[0003] [0005]**
- US 4497679 A **[0009]**
- US 2735797 A **[0010]**
- GB 253362 A **[0011]**
- IT UD20050069 A **[0035]**