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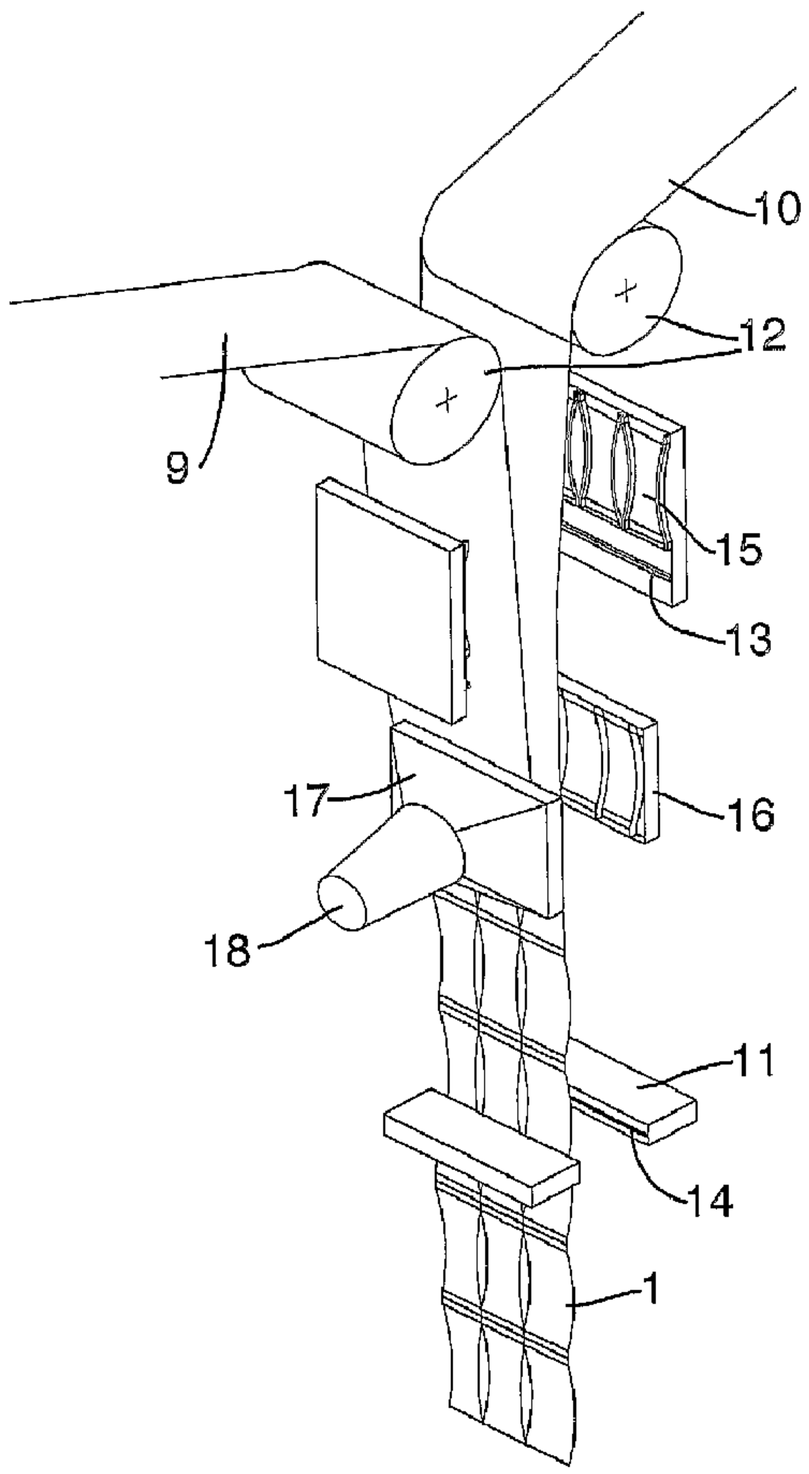
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(57) Abrégé/Abstract:
The invention provides a process for the manufacture of sachets (1) in a plurality of lanes in a form fill and seal machine, one or more edges of said sachets comprising non-linear profiles (7) over at least 10% of the length of the edge, said sachets

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(57) Abrégé(suite)/Abstract(continued):
manufactured by a process comprising: (i) sealing two films (9,10) in the longitudinal direction to form a plurality of tubes parallel to each other; (ii) sealing the tubes along one end; (iii) filling the tubes with the desired material; (iv) sealing the tubes at the second end to form a plurality of sachets (1), and (v) punching out portions (8) of the sealed edges of the sachets to define the non-linear edges (7).

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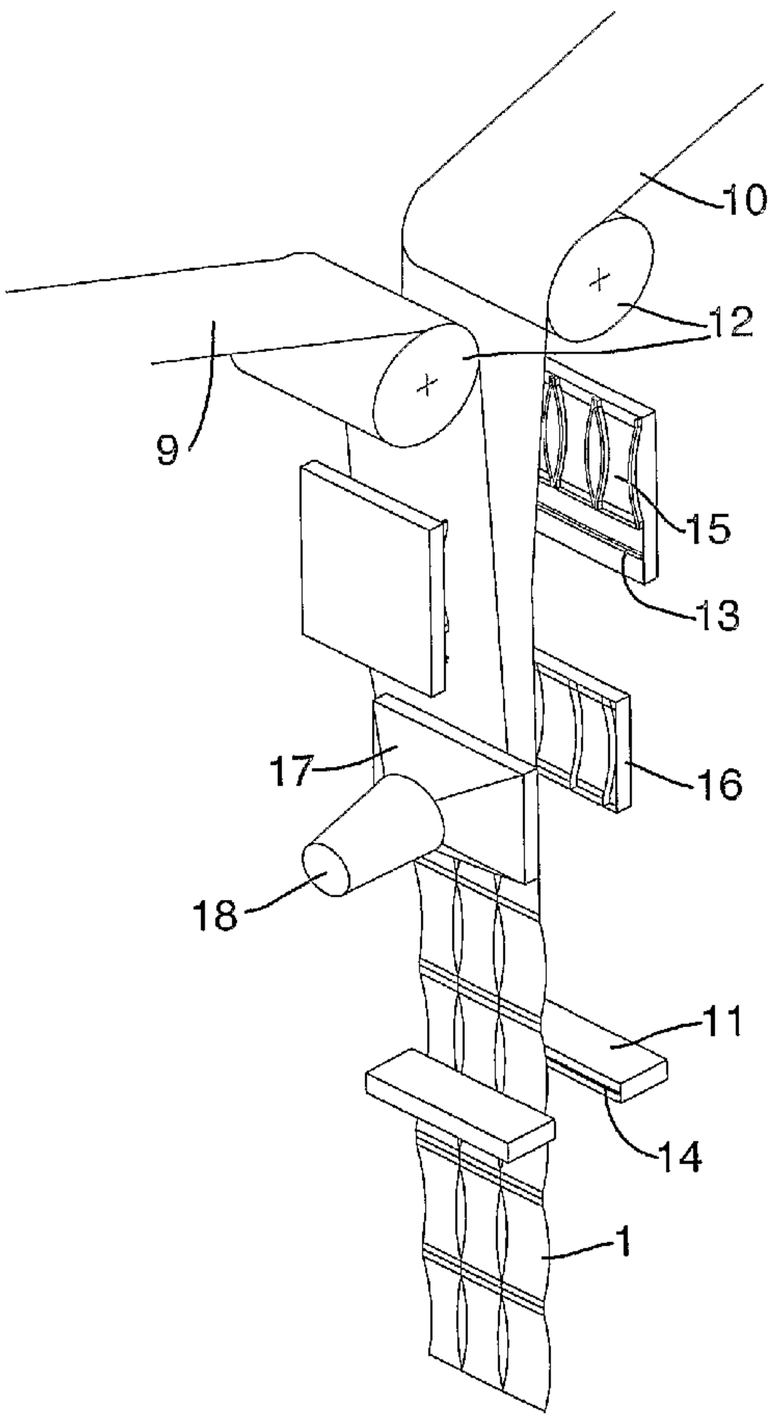
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[Continued on next page]

(54) Title: IMPROVED PACKAGE

(57) Abstract: The invention provides a process for the manufacture of sachets (1) in a plurality of lanes in a form fill and seal machine, one or more edges of said sachets comprising non-linear profiles (7) over at least 10% of the length of the edge, said sachets manufactured by a process comprising: (i) sealing two films (9,10) in the longitudinal direction to form a plurality of tubes parallel to each other; (ii) sealing the tubes along one end; (iii) filling the tubes with the desired material; (iv) sealing the tubes at the second end to form a plurality of sachets (1), and (v) punching out portions (8) of the sealed edges of the sachets to define the non-linear edges (7).



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IMPROVED PACKAGE

FIELD OF THE INVENTION

The invention relates to an improved process for the manufacture of sachets in a plurality of lanes in a form fill and seal (FFS) machine.

BACKGROUND AND PRIOR ART

Sachets have been used for packing various types of products like creams, powders, liquids, tablets, noodles, granules, and pastes in various fields of technology. Sachets enable packing and selling of these products in small quantities compared to conventional packaging like bottles and jars. The sachets also enable convenient use during travel when smaller quantities in so-called 'unit-dose' amounts can be carried without spillage. The products are dispensed by tearing the sachets and using the product for a single use after which the sachet packing is discarded. The sachets are also very convenient for sale to new consumers who do not want to spend a lot of money trying out new products since the cost of the product in a sachet is much lower as compared to those sold in conventional units like a bottle or a jar. Thus a consumer who wants to try a new product need not spend a lot of money buying a large quantity of the product in the conventional bottle or jar. The sachet packaging has also enabled consumers in the developing

countries who do not have a lot of spare money, to purchase these products in small quantities in the sachet packaging.

Sachets are manufactured in machines where several sachets are formed and filled, each sachet connected to the next in a long string. This string of sachets can then be hung at the point of sale for high visibility. Each sachet in the lane is separated by perforations which enable easy tearing of the desired number of sachets from the string based on the customers demand. Recently, multiple lanes of sachets are also available which is displayed at the point of sale in the so called curtain format. The sachets in the curtain format are separated by perforations along the two longitudinal edges as well as the top and bottom of the sachet.

Sachets have been manufactured in a variety of materials based on the product to be packaged. Products like tea and coffee have been packaged in porous paper which enable infusion of the tea/coffee when the sachet is dipped in hot water. For most other products in the detergent and cosmetic industry, the sachets have been prepared from synthetic polymers. The development of automatic machines like the form fill and seal (FFS) machine has enabled very high production rates of sachets. These machines form the sachets from two films which define the front surface and the rear surface, usually by heat sealing three edges to form a three edged pocket, followed by filling of the product in the said pocket, after which the fourth edge is sealed. The sachets may be cut into single lanes or may be sold in the curtain format. Perforations are provided where

required along the seals to enable easy separation by tearing one or more sachets from the rest of the strip or curtain.

While the conventional sachets are usually in the rectangular or square shape, methods/processes to manufacture sachets/pouches having non-linear edges have been reported. These sachets/pouches provide for attractive shapes and distinctiveness to the package and the products packed therein.

EP 0378027 (Modern Packaging, 1990) describes a process for the manufacture of individual sachets each containing a product which process comprises the operations of (a) preprinting two films, which form the opposite sides of the sachets and are heat-sealable on the inner sides, with the desired inscriptions on the outer side (b) bringing the two films substantially close together for depositing a product (c) partially heat-sealing the sachet around the deposited area to form the sachet in a first sealing station (d) the sachet thus profiled is displaced towards a second sealing station (e) completing the sealing in a second sealing station (f) stamping out the sachet from the web in a cut-out station using a die and a mould corresponding to the profile desired for the sachet (g) the sachets thus cut out are collected while the web cut is evacuated (h) the sachet being cut out along the heat-sealed cheek of the web characterized in that (i) the marginal areas of the representation of the container are provided in excess with respect to the future line of cut-out, allowing a certain tolerance in the concordance between the cut-out line and

edge of said representation and (j) deposition of a superficial layer of a decorative transfer film , at any stage in the process, which decorative transfer film has the decoration corresponding to the said representations on the apparent face of the film or web having to constitute the sachet.

WO0123271 (Cryovac, 2001) describes a pouch, and a process and an apparatus for the preparation of said pouch, the pouch comprising a first lateral edge and a second lateral edge, each of the first and second lateral edges comprising a concave surface and a convex surface, wherein the concave surface of the first lateral edge is substantially opposite the convex surface of the second lateral edge and the convex surface of the first lateral edge is substantially opposite the concave surface of the second lateral edge.

These prior art documents teach processes for the preparation of shaped sachets/pouches where the sachets/pouches are essentially required to be cut out from the webs either as single pieces or the sachets are cut out from the web at most as a string. EP0378027 describes a process where the individual sachets are cut out from the web while the remaining web material is discarded. The process of this prior art entails wastage of a large amount of unutilised web material. Moreover this prior art does not enable the production of the sachets in a plurality of lanes which could then be displayed at the point of sale for high visibility of the sachets and the decoration thereon.

WO01/23271 also describes pouches and process to prepare them which essentially requires the pouches to be cut into single strips thereby not providing for the curtain format. The pouches of this prior art further suffers from the disadvantage that the curved shape of one lateral edge has to be complementary to the shape on the other lateral edge thereby restricting the flexibility of providing various shapes which may be desired to be given to the packaging.

There is a need felt in the art for providing for a process to prepare sachets which comprise a variety of non-linear edges, which can be made available in a plurality of lanes for high visibility at the point of sale.

OBJECTS OF THE INVENTION

It is thus an object of the present invention to provide for a process for the manufacture of sachets having a non-linear edge profile which can be displayed in a plurality of lanes for high visibility at the point of sale.

It is a further object of the invention to provide for a process for the manufacture of sachets having a non-linear profile on its edge, which in addition to being made available in a plurality of lanes, enables easy removal of any number of sachets from the plurality of lanes without causing damage to the seal and subsequent leaking of the product.

It is a further object of the invention to provide for a process for the manufacture of sachets having non-linear profile on its edge, which can be made available in a plurality of lanes, enables easy removal of any number of sachets from the plurality of lanes without causing damage to the seal and additionally provides for minimum wastage of the web material thereby being cost-effective.

It is a further object of the invention to provide for a process for the manufacture of sachets having non-linear profile on its edge, which can be made available in a plurality of lanes, enables easy removal of any number of sachets from the plurality of lanes without causing damage to the seal, provides for minimum wastage of the web material thereby being cost-effective and additionally provides for a variety of non-linear shapes on one or more of the edges thereby providing for distinctiveness of the package and the product packed therein.

SUMMARY OF THE INVENTION

According to the invention, there is provided a process for the manufacture of sachets in a plurality of lanes in a form fill and seal machine, one or more edges of the sachets comprising non-linear profiles over at least 10% of the length of the edge, the sachets being manufactured by a process comprising:

(i) sealing two films in the longitudinal direction to form plurality of tubes parallel to each other

(i) sealing the tubes along one end;

(ii) filling the tubes with the desired material;

(iii) sealing the tubes at the second end to form a plurality of sachets, and

(iv) punching out portions of the sealed edges of the sachets to define the non-linear edges.

It is particularly preferred that non-linear profile on the edge of the sachet is a curved profile.

It is also particularly preferred that the non-linear profiles are on the longitudinal edges of the sachets.

The present invention will be described further in reference to non-limiting embodiments of the invention by way of accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

In the drawings:

FIG.1 is a schematic of one of the embodiments of the process for manufacturing the sachets in the plurality of lanes in an FFS machine.

FIG. 2 is a front schematic view of a portion of the sachet in a curtain format where every longitudinal edge has one cut-out portion covering about 95% of the length of the longitudinal edge.

FIG. 3 is a front schematic view of a portion of another sachet assembly in a curtain format where every longitudinal edge has two cut-out portions covering about 85% of the length of the longitudinal edge.

DETAILED DESCRIPTION

The invention provides for a process for the manufacture of sachets in a plurality of lanes in the form fill and seal (FFS) machine. Although the sachets of the invention can be manufactured in either the horizontal or the vertical FFS machine, it is preferred that it is manufactured in the vertical FFS machine.

The invention concerns process for the manufacture of sachets having at least one edge which comprises a non-linear portion. By the term 'non-linear', for the purpose of this invention, is meant profiles which are not definable by a single straight line. The term 'non-linear' includes angled bends formed when two or more lines are joined to each other, curves of any shape and combinations thereof. It is preferred that the non-linear profiles are curved profiles. The non-linear edges could be on either the longitudinal edges or the transverse edges of the sachets, although the non-linear edges are preferably on the longitudinal edges. By the term 'longitudinal edges' is meant the edges defined by sealing the films in the longitudinal direction of the films i.e the film in the lengthwise direction. The longitudinal edges are sometimes referred to as the lateral edges of the sachets e.g the left

lateral edge and the right lateral edge. The transverse edges of the sachets are edges in the direction perpendicular to the longitudinal edges i.e as it is sealed breadthwise on the film. The transverse edges usually define the top and the bottom of the sachet.

The edges of the sachets comprise non-linear profiles extending over atleast 10% percent of the length of the edge, more preferably at least 30%, further more preferably at least 60% and most preferably at least 90%of the length of the edge. The profiled edges appear as cut out portion when the sachets are manufactured in a plurality of lanes in the FFS machines. The profiles of the edges could be formed from one or more cut out portions. Although the number of lanes of sachets which can be produced in an FFS machine is dictated by the width of the sachet, it is preferred that the number of lanes are between two and sixteen, more preferably between 4 and 12 and most preferably between six and twelve. It is also possible to have a profile on one edge of the sachet and a different profile on another edge.

Several types of polymer materials may be used in the process of the invention. The preferred materials include high density polyethylene (HDPE), low density polyethylene (LDPE), linear low density polyethylene (LLDPE), or laminates comprising of poly ethylene terephthalate (PET), biaxially oriented polypropylene (BOPP), metallised PET, foil or polyethylenes. Very often, laminates of more than one material are used for improved physical, thermal, mechanical and printiability properties. It is particularly preferred that the two surfaces which are brought in contact

for forming the inside surface of the sachet are heat-sealable.

The view of Figure -1 depicts an embodiment of the FFS machine for forming the sachets as per the invention. The sachets in the FFS machine are prepared from two films or webs which form the front (9) and the rear (10) surface of the sachet. The two films are preferably prepared from a single web which is unwound from an unwind station comprising a feed roll (not depicted in the figure). The feed web is then preferably slit into two halves in the longitudinal direction to form the front and the rear surface of the sachet. Alternatively the two films may be fed from two separate feed rollers.

The tension on the films is maintained by any means which maintains the films in a taut position. Conventional roller based pulling system may be used, more preferably a mechanically driven pull assembly (11) may be utilized.

The view of figure 2 depicts an embodiment of the sachets manufactured in the curtain format as per the invention. The films forming the front and the rear surface of the sachet are fed to the FFS machine through appropriate feeder assembly (12).

The films are sealed along the longitudinal direction (41, 51, 61) to form the plurality of tubes (A1, A2, A3) using a system of vertical sealing jaws (15). The vertical sealing jaws are preferably designed to include the desired dimensions especially the width of the portion (8) desired

to be cut-out to define the profile of the sachet. The longitudinal sealed portions may then preferably be perforated (6) using a perforation means (not shown in figure).

In this embodiment of the process, the bottom edge (2) of one row of sachets (e.g. A1, A2, A3) which is the top end of the sachets just below it (not shown in figure) is sealed using the same sealing system (15,13) which seals the longitudinal edges of the next row of sachets (B1, B2, B3). However, this sealing system does not limit the invention and it can be envisaged that alternate systems of sealing may be used e.g. where the sealing of the longitudinal edges and the transverse edges are separately configured.

Thus the bottom edge (2) of the tubes (A1, A2, A3) is formed by sealing the two films using the sealing means (13, 15) which simultaneously forms the tubes (B1, B2, B3) by sealing along the line (42, 52, 62). The sealing is preferably carried out using a heat sealing machine. The sealing jaws are driven intermittently preferably using a mechanical drive. The heating elements are preferably PID controlled.

The product is then filled into the sachets formed (A1, A2, A3) from the open as yet unsealed edge (22).

The unsealed edge (22) which is the top edge of the sachets (A1, A2, A3) and the bottom edge of the sachets (B1, B2, B3) is then sealed using sealing means (13, 15) which simultaneously forms the tubes (C1, C2, C3) by sealing along the lines (43, 53, 63).

The profiles (7) are formed by punching out the cut-out portions (8). This operation is preferably carried out in a punching station. The punching station preferably comprises of a punch plate (16) having the punches on one side of the film and a die plate (17) on the other side of the film which are correspondingly aligned. The punch plate (16) could be mechanically or pneumatically activated. The punch plate (16) and the die plate (17) are preferably guided by a punch guide.

The cut-out portions (8) from the punching stations are preferably removed using an air-blow/ suction means (18). Preferably an air blow means followed by a suction means is used to remove the cut-out portions.

The sachets (A1, A2, A3) having the desired shaped profiles are thereby manufactured by way of the invention.

The sachets (B1, B2, B3) are then filled with the desired material. Thereafter the top edge 32 of sachets (B1, B2, B3) which is also the bottom edge of the sachets (C1, C2, C3) is then sealed. The sachets (B1, B2, B3) are then shaped as described in the case of the sachets (A1, A2, A3).

The seals in the transverse direction may preferably be perforated (3) using a perforation means (14). It is preferred that the perforation means is pneumatically activated.

The manufacturing operation is then continued as described in the case of the sachets (A1, A2, A3) and (B1, B2, B3) till the entire film is used up after which the next roll of film is loaded on to the system.

Figure 3 depicts an embodiment of the sachets manufactured by the process of the invention where there are two cut out portions. These cut-out portions together separate adjacent sachets by about 85% of the length of the longitudinal edge.

Thus according to a preferred aspect of the invention there is provided a process for the manufacture of sachets in a plurality of lanes in a form fill and seal machine, longitudinal edges of said sachets comprising curved profiles, over at least 10% of the length of the said longitudinal edge by a process comprising

(i) sealing two films in the longitudinal direction to form plurality of tubes parallel to each other
(ii) perforating the first and the second longitudinal edges of the tubes thus formed
(iii) sealing the tubes along the bottom end
(iv) filling the tubes with the desired material
(v) sealing the tubes at the top end
(vi) punching out portions of the sealed longitudinal edges to define the curved profiles
(vii) removing the portion using an air-blow/ suction means and
(viii) perforating the bottom seal with a second perforation means

It is thus possible by way of the invention to manufacture sachets having non-linear edge profiles, in the curtain format. These sachets provide for distinctive character of the package and thereby the products being sold in them while enabling high visibility of the sachets when displayed at the point of sale. Moreover the sachets are prepared in a sturdy manner and ensure no leakage when any number of sachets are removed from the curtain by tearing.

Importantly the invention provides for all of the above features while keeping the cost of production low by minimizing the amount of wastage of the web in the form of cut outs.

CLAIMS

1. A process for the manufacture of sachets in a plurality of lanes in a form fill and seal machine, one or more edges of said sachets comprising non-linear profiles over at least 10% of the length of the edge, said sachets manufactured by a process comprising:

(i) sealing two films in the longitudinal direction to form a plurality of tubes parallel to each other;
(ii) sealing the tubes along one end;
(iii filling the tubes with a material;
(iv) sealing the tubes at a second end to form a plurality of sachets, and
(v) punching out portions of the sealed edges of the sachets to define the non-linear edges.

2. A process according to claim 1 wherein said non-linear profiles are curved profiles.

3. A process according to claim 1 or claim 2 wherein said non-linear profile is along the longitudinal edge of said sachets.

4. A process according to any one of claims 1 to 3 wherein said non-linear profile comprises at least 30% of the length of said edge.

5. A process according to claim 4 wherein said non-linear profile comprises at least 60% of the length of said edge.

6. A process according to claim 5 wherein said non-linear profile comprises at least 90% of the length of said edge.

7. A process according to any one of claims 1 to 6 wherein tension is maintained on said films using a mechanically driven pull assembly.

8. A process according to any one of claims 1 to 7 wherein said sachets in a plurality of lanes are perforated along the longitudinal edges.

9. A process according to any one of claims 1 to 8 wherein said sachets in a plurality of lanes are perforated along the transverse edges.

10. A process according to any one of claims 1 to 9 wherein said films are heat sealed.

11. A process according to any one of claims 1 to 10 wherein punching is carried out in a punching station that comprises of a punch plate having punches on one side of the film and a die plate on the other side of the film which are correspondingly aligned.

12. A process according to any one of claims 1 to 11 wherein said portions are removed using at least one of an air blow means and a suction means.

Fig.1.

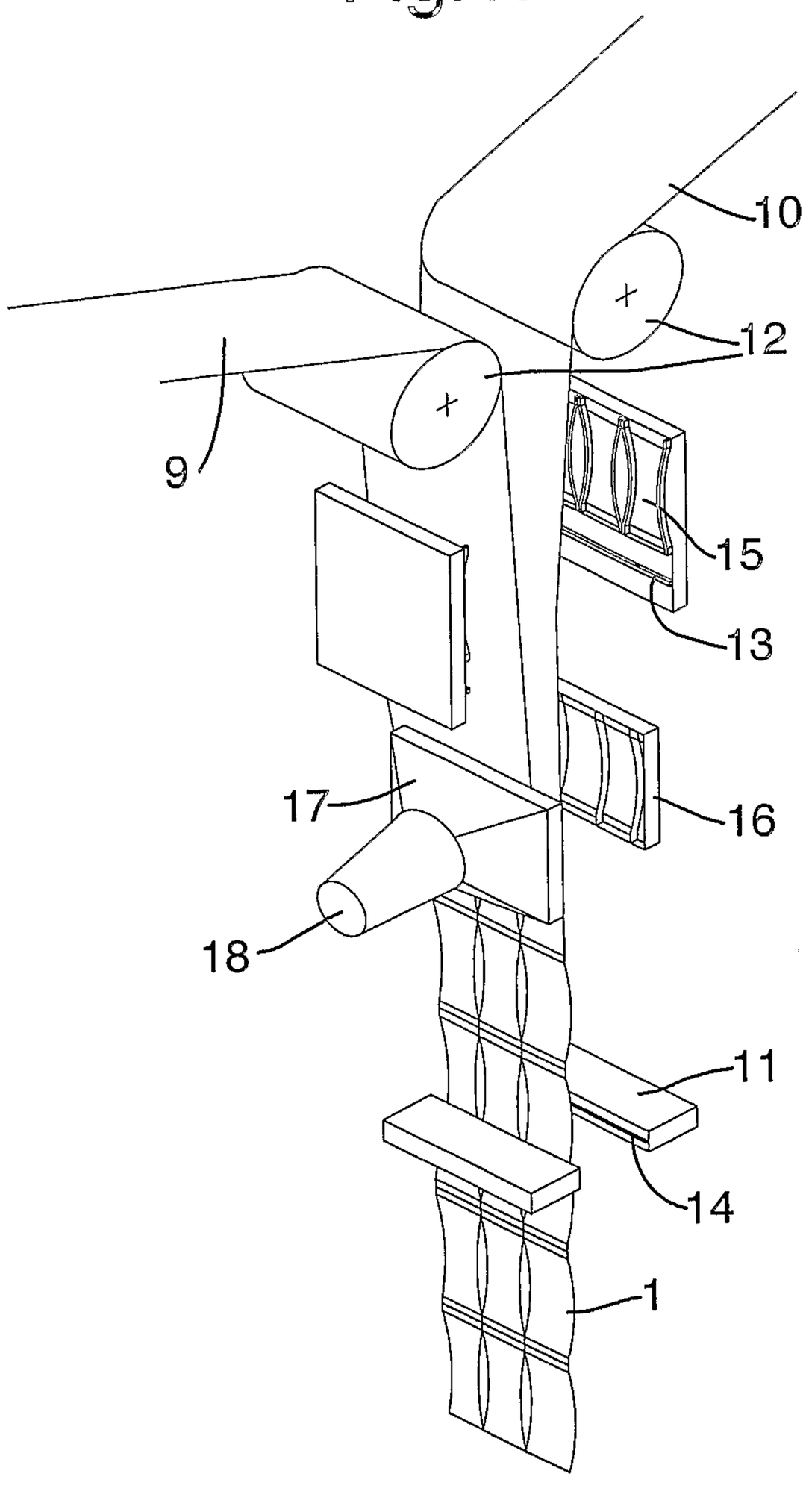


Fig.2.

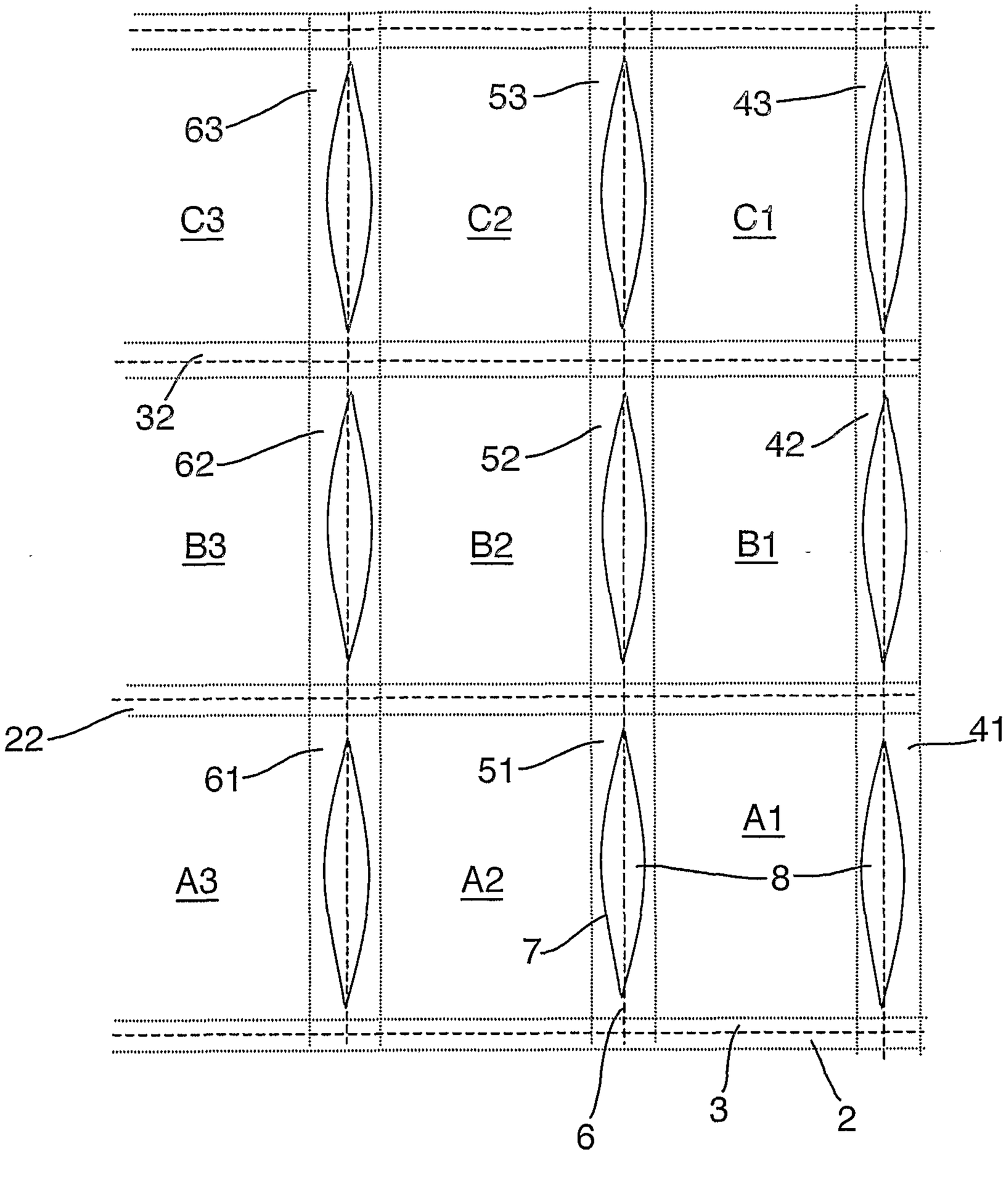
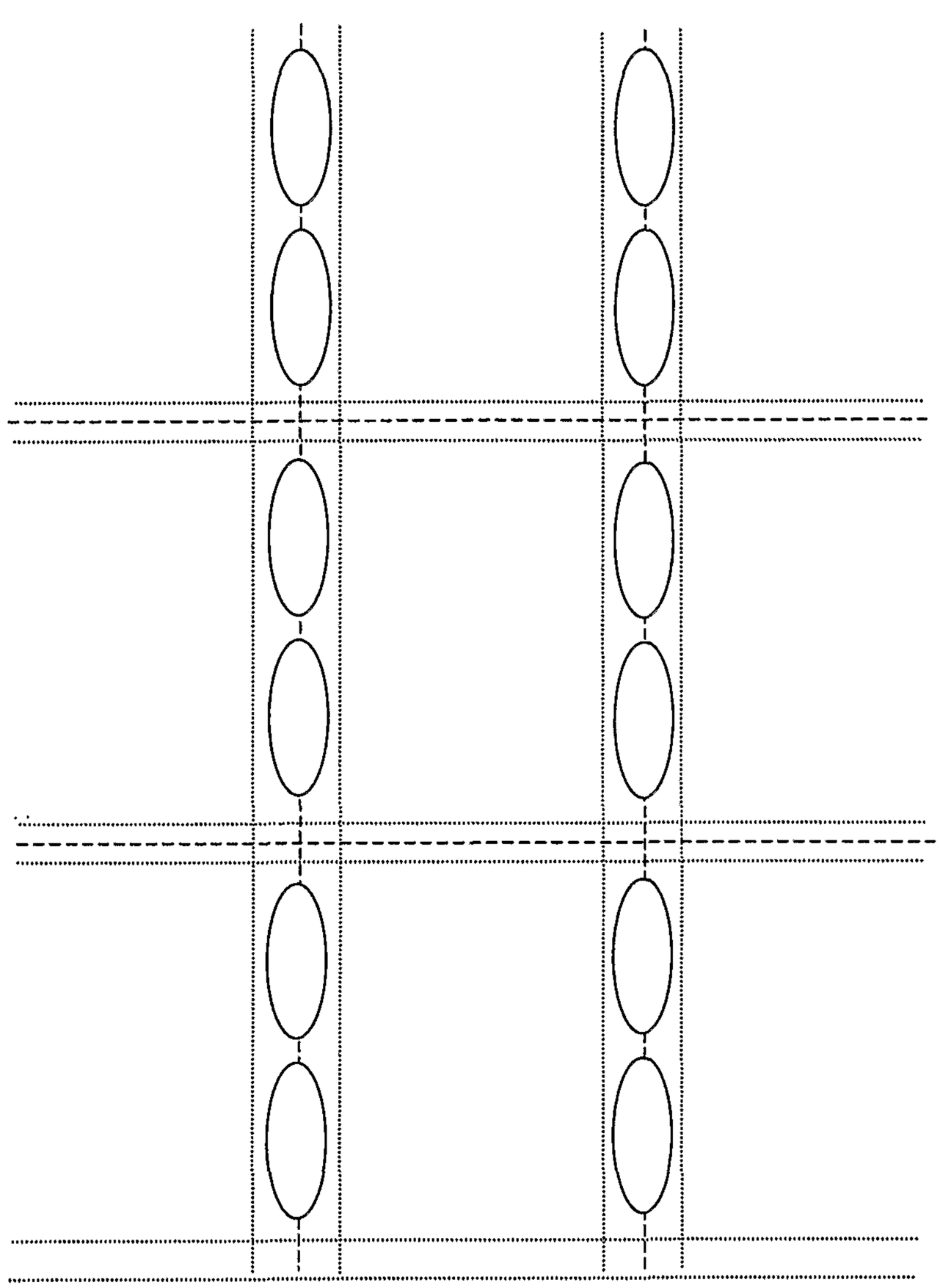
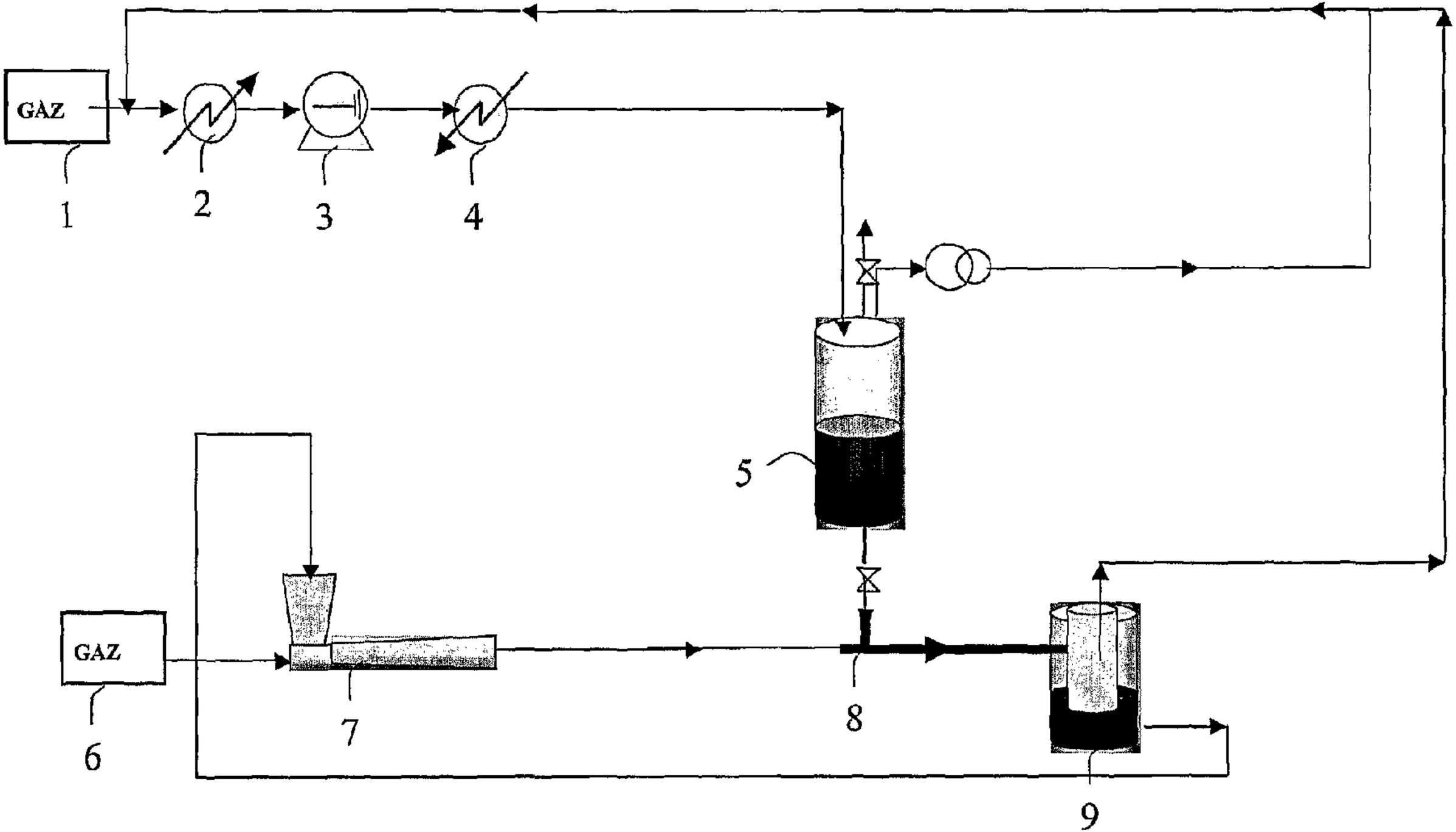


Fig.3.




GAZ
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GAZ
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