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(54) Package for cigarettes, cigars and similar articles, and method of manufacturing same.

(57) The cigarettes (S) are introduced into shells (1) of plastics material, made by a thermoforming process from a continuous sheet. The shells are so shaped as to be provided with seats (3), whereby the cigarettes will remain positioned properly within said shells, both while being packaged and while being used. The cigarettes are deposited into said shells, and thereafter a continuous sheet (S) of aluminium material is heat-sealed on the peripheral edges of the shells. A pull tape (6) is positioned longitudinally under said covering sheet. By a blanking operation, the closed shells containing the cigarettes are then severed from the continuous sheets from which they have been made. The edge (101') of the shell adjacent to one row of cigarette ends is lower than the other edges (101) and may be even co-planar with the bottom of said shell. The edges that are adjacent to said lower edge merge therewith through inclined portions (101''). By removing the portion of covering sheet (5) at said lower edge (101'), the cigarettes can be easily withdrawn unharmed from said shell.

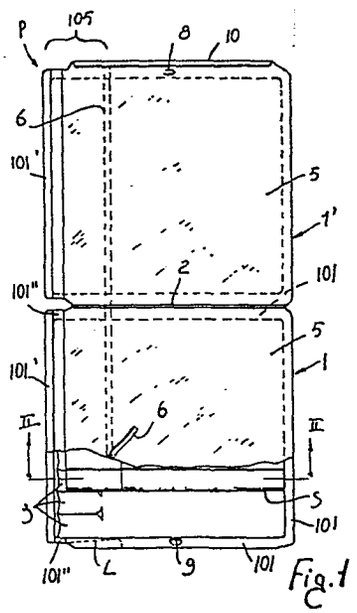

Fig.1

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Package for cigarettes, cigars and similar articles, and method of manufacturing same.

Many attempts have been made lately to make a new type of cigarette package which may be manufactured more easily and quickly than conventional packages and which, unlike the latter, may be manufactured continuously and immediately adjacent to a cigarette-making machine. One of these attempts, for example, is disclosed in the Swiss Patent No. 529.004. The proposed package comprises two flat and identical shells, of plastics material, connected to each other by means of a flexible hinge which is integral with said shells, so that the latter may be closed like the valves of a shell-fish. Each shell is provided with rectilinear channels which are parallel to the hinge axis and are so shaped as to snugly receive and retain one cigarette in each of them. Such containers, which are of injection-molded plastics, are positioned horizontally in single file with the open side of each shell facing upwards, on a rectilinear conveyor which

advances them in a direction which is perpendicular to the direction of the channels in said shells. While said shells are advanced, an upper suction drum withdraws the cigarettes from a reservoir wherein they are arranged parallelly to the channels in the shells therebelow and, through a rotary motion, transfers the cigarettes in a timed sequence into said channels. On completion of a cycle, the shells are closed like a book and the thus-formed package is packed within a sealed wrapper. This system, while permitting a high-speed packing of the cigarettes, has serious drawbacks that can be summarized as follows. Upon forcing the cigarettes into the retaining channels provided in the shells, said cigarettes were damaged unacceptably. The feeding of shells to a cigarette-making machine was problematic due to the difficulty of matching the rates of forming the shells with the much more rapid rates of a cigarette-making cycle.

The German OS 1923588 discloses a cigarette package formed from two sheets of heat-sealable plastics material, one of which is flat and completely covers a shell which is formed from the other sheet and which is provided with parallel channel-shaped seats, each of which can accommodate a cigarette. These seats are shorter than the cigarettes, whereby the latter will have one end terminating in a single seat. Said seat is divided, transversely to a cigarette, into two portions which are fixed to each other by an outer pull-tape. By removing this tape, due to the flexibility of the material constituting the package, the latter may be opened at will, just like a conventional

hard package. This attempt, however, presents difficulties in the high-speed manufacturing of a package formed by two portions fixed to each other by means of a pull-tape.

This invention provides a cigarette-package that overcomes all the drawbacks mentioned above and is distinguished by the following characteristic features:

- it comprises a smaller number of components, and it is made with such a procedure as to be manufactured rapidly and at reduced costs;
- it presents a large flat surface that can be used, if desired, to bear advertising messages;
- it may be opened gradually, whereby the organoleptic characteristics of tobacco are protected until each cigarette is used;
- it permits an easy extraction of cigarettes.

These and other characteristics of the invention and the advantages resulting therefrom will be apparent from the following description of some preferred embodiments shown in the accompanying sheets of drawings, in which:

Figure 1 is a top plan view of an opened package of cigarettes;

Figure 2 shows some constructional details of the package, taken along the lines II-II of Figure 1;

Figures 3, 4 and 5 are a top plan view and side views in the direction of the arrows H and K in Figure 3, respectively, of a closed package;

Figure 6 shows the package of Figure 2, during the extraction of a cigarette;

Figure 7 is a similar view similar to Figure 2, which shows a modified embodiment of the package;

Figure 8 is a perspective view of a modified embodiment of a package having a single shell;

Figures 9 and 10 are elevational views of two modified embodiments, respectively, of the package of Figure 8, looking in the direction of the arrow Z;

Figure 11 is a diagrammatic side elevational view of a plant for carrying out the process for manufacturing the package of the invention on an industrial scale;

Figure 12 is a front elevational view of the final portion of the plant of Figure 11.

The invention proposes to pack the cigarettes into shells of plastics material which are closed thereafter by means of a sheet of aluminium or any other suitable heat--sealable material, as is known in the art of packing foodstuffs such as yoghourt, dessert, hydrogenated vegetal

fats, mayonnaise or the like. In order to use practically said method of packaging cigarettes or similar products, the following problems have been solved:

- the shape of the shell for accommodating the cigarettes had to be such as to permit the cigarettes to be withdrawn therefrom easily and without distorting or breaking said cigarettes;
- the covering sheet of aluminium or equivalent material was to be applied so as to be removed progressively, whereby the cigarettes could remain encased within said shells until they are used;
- the package was to get out of the operative cycle in such conditions whereby the aluminium covering sheet had to be well protected to avoid any accidental tearing thereof.

These and other problems have been solved as follows.

With reference first to Figures 1 to 5, it will be noted that, in a preferred embodiment, the new package comprises two identical and substantially parallelepiped shells 1-1' which are normally of such dimensions whereby each of them can accommodate ten cigarettes S orderly arranged in a single layer, the depth of said shells being equal or slightly larger than the diameter of a cigarette S. Preferably, said shells are of plastics material and are made by a thermoforming process from a continuous sheet of thermoplastic non-toxic material. However, it is to be understood that said shells may be made of any other

suitable material which, moreover, can be cold-drawn. For example, it is contemplated that said shells may be drawn from a foil of aluminium and/or any other metal.

The shells are provided, at the top thereof, with an integral edge or collar 101 which interconnects said shells so that they may rotate around at least one intermediate hinge line 2. The corner portions of the shells and of their top collar 101 (see below) are suitably rounded. To prevent the cigarettes from moving in the shells after that some cigarettes have been withdrawn therefrom, and to facilitate the automatic introduction of the cigarettes into said shells (see below), the bottom of said shells is provided with seats having the shape of parallel channels 3, each of which accommodates a cigarette and embraces a portion of its circumference. As viewed in the Figures 1, 2 and 3, the channels 3 are, preferably, of such a length as to extend on one or two opposed portions of the bottom of said shells, so that the remaining portion 4 of said bottom will be left flat. The outer face of said flat portion may bear inscriptions indicating the product packed therein, or appropriate advertising messages. Said inscriptions or messages may be previously printed on a sheet which is heat-sealed on the surface 4 during the thermoforming of the shells 1-1', or they may be printed directly on the sheet from which said shells will be formed. It is to be understood that in another embodiment the channels 3 may be constituted by a corrugated or pleated support member which is inserted into each shell. In this instance, the bottom of the

shells may be entirely flat with the obvious advantages resulting from this condition, particularly the additional space for advertising messages. After the product S has been introduced into the shells 1-1', said shells are sealingly closed by means of a continuous sheet 5 of aluminium and/or any other suitable material which may be affixed, by heat-sealing or any other suitable technology, to the edges or collars 101 of said shells. The exposed surface of the covering 5 may be used for advertising messages.

The cigarettes are accommodated in the shells in an orderly arrangement and so that, if they are provided with filters F, the latter will be always located on one side. With reference to Figures 1 and 2, it will be noted that one of the edges of each shell, i.e. the edge 101', which is adjacent to one of the ends of the cigarettes S, and preferably adjacent to the end which is provided with a filter F, instead of being co-planar with the other three edges is actually at a lower level, i.e. at a short distance from the bottom of the shell, and parallel to the other edges. The edges 101 which are adjoining to the edge 101', are connected to the latter through inclined merging portions 101". The covering 5 is then sealed peripherally to the edges 101-101'-101" of each shell 1-1'. According to a modified embodiment, shown in Figure 7, the edge 101' may be co-planar with the bottom of the shells, said bottom being provided, if desired, with a rib 201 having also the purpose to suitably retain the cigarettes within said shells.

According to the invention, a suitably wide portion 105 of the covering 5 may be removed to expose the end portion of the cigarettes which is located near the lower edge 101', whereby due also to the particular location of the said lower edge, the cigarettes may be easily withdrawn unharmed from the shells, as shown in Figure 6. To achieve said local opening of the covering 5, the latter is provided, preferably on its undersurface, with a thread or band 6, possibly affixed previously to said covering or, anyhow, heat-sealed to the edges 101 of the shells, so that by acting on said tape the user can tear away said covering progressively. The location of said pull tape may be indicated, if desired, either by a line printed on the exposed face of the covering 5, or by an end portion of said pull tape projecting from said covering 5. It is to be understood that, instead of a single pull tape, a plurality of pull tapes may be provided, and that said pull tape might be as wide as the opening to be formed on the covering 5. In case the edge 101' of the shells is co-planar with the bottom of said shells, as shown in Figure 7, said pull tape may be so positioned or may have such a width as to cause the removal of only the portion 105' of covering 5 which is secured to the inclined portions 101" of the edges of said shells. According to a further modified embodiment, the pull tape may be even avoided if known solutions are used, e.g. if a portion of the edges 101 is formed with weakening means and/or if the periphery of the covering 5 is provided with tabs formed by non-welded portions of said covering 5, as indicated with L and with dotted lines

in Figure 1, so that by acting on said tabs the user can remove the desired portion of said covering.

After covering the shells 1-1', the latter are folded over like a book as shown in Figures 4 and 5, by rotating them about the pivot line 2, whereby both coverings 5 will be facing each other and will be protected within the thus-formed package P. Over the intermediate portion of the now facing edges 101, i.e. the edges which are parallelly opposite to the pivot line 2, there may be affixed, if desired, the State Revenue Stamp 7 (Figure 4). These two edges may be formed, if desired, with mating recessed and protruding portions, respectively 8 and 9, which co-operate with each other for mutually centering the two shells, said shells being held in their closed condition by a curved tab 10 formed integrally with one of said edges and co-operating with a snap action with the other edge, as shown clearly in the Figures 3, 4 and 5. The portions 8, 9 and 10 may be formed during the heat--sealing of the covering 5, and/or during the thermo-forming of the shells 1-1", or during a successive step, as described below.

It is to be understood that the package P as described above, is intended to be protected even when the shells are folded over each other so as to expose the respective covering 5. It is also to be understood that the shells 1-1' may have either the same or different containing capacities, and that they may contain a number of cigarettes other than ten, and that the cigarettes may

be arranged in a number of layers other than two. As an alternative to the described embodiments, the shells 1-1' may be formed separate from each other and may be so marketed. In this instance, it is contemplated that the single-shell package P' may be provided with a lid 11 formed integrally with said shell as shown in Figure 9, or formed separately as in the embodiment of Figure 10 and adapted to be applied on said package, so as to protect the covering 5 and to avoid any leakage of tobacco from an opened package.

The single-shell package P' may contain any number of cigarettes arranged either in one or in a plurality of layers.

With reference to Figures 11 and 12, a plant for manufacturing cigarette-packages of the type according to the invention will be described briefly. In Figure 11, the numeral 12 indicates a bobbin for a continuous sheet of thermoplastics material for the formation of the shells 1 or 1-1' with the channels 3 disposed transversely to the feeding direction F of the sheet 12. The numeral 13 indicates the direction-changing and strain--relieving rollers for the sheet 112, and the numerals 14--14' indicate grippers for advancing the sheet 112 in combination with the operative stations of the plant, as described below. The numeral 15 indicates the station for heating the sheet 112, and the numeral 16 indicates the thermoforming station for creating the shells 1-1' with their open side facing upwards. The hinge lines 2 and the

portions designed to constitute the closure means 8, 9, 10 may also be formed in this station. After the thermoforming step, the cigarettes S are introduced into the shells. This is effected at a station 18 which is provided with a plurality of operative units 118 arranged successively to each other and designed to introduce the cigarettes into the channels 3 in the shells, with a comparatively low operating rate so as to avoid any damage to the cigarettes. The operative units 118 are of known type, such as described, for example, in the Swiss Patent mentioned in the preamble of this specification, and comprise rotary drums which withdraw the cigarettes from a feed hopper and transfer them timely into the channels 3 of the shells. The units 118 operate at a lower rate (thus avoiding damaging the cigarettes) because they are in a plurality, so that the channels in the shells do not depend on only one unit. Each unit 118 fills only one fraction of the channels 3 passed therebelow, while the other channels are filled by the successive units 118.

Subsequently to the station 18 there is arranged a unit 19 for detecting any possible absence of cigarettes in the shells and controlling suitable means located downstream and described below, for removing automatically the defective packages from the operative line. After the introduction of the cigarettes into the shells, the covering sheet 5 of aluminium and/or any other suitable material is applied at a successive station 20 where it is affixed by heat-sealing to the composite edge 101-101', 101" of said shells. The sheet 5 is unwound from a bobbin

17. The pull tape 6 may be fixed previously to the sheet 5 or, alternatively, may be fixed thereto from a bobbin 21, means (not shown) being provided in this instance to affix the tape 6 to the sheet 5. The numeral 22 indicates a blanking station for severing the shells from the continuous sheets from which said shells have been made. This station may be designed to form also the pull tabs L for tearing the covering 5 (Figures 1-8) and to form or to complete the formation of the hinge or pivot lines 2 and of the portions 8-9-10.

All the stations 15-16-20-22 are mounted on synchronized slide and guide assemblies, diagrammatically indicated by the connecting line 23, by means of which said stations follow cyclically the sheet 112 during its advancement in the direction of the arrow F.

On completion of the active stroke of the stations 15-16-20-22, the latter are replaced by the kinematic connection 24 which, through the grippers 14-14', advances the sheet 112 in the direction of the arrow F.

The shells 1 or pairs of shells 1-1' exiting from the blanking station 22 are collected onto a conveyor 25 and are transferred by the action of grippers 26 to the station Q1 of a rotary conveyor 27 which is timely rotated in the direction of the arrow F1 (Figure 11). At the station Q2 of said rotary conveyor the closure tab 10 of the package P is formed, while at the station Q3 the shells 1-1' are closed like a book on each other and said

tab 10 is thermally stabilized in its closure position. At the station Q4 suitable means are provided to eject any defective package (this is the station which is controlled by the detector 19 of the production line), while at the final station Q5 the packages P are stacked and packed to form a conventional carton.

It is to be understood that the package according to the invention is intended to be protected even if obtained by means of plants different from the one which is shown in the Figures 11 and 12, which is merely an embodiment to illustrate more clearly the sequence of the operative steps for manufacturing the new cigarette package on an industrial scale.

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CLAIMS

1) A package for cigarettes, cigars or the like articles, comprising at least one shell (1) of substantially parallelepipedal shape, made preferably of plastics material, and dimensioned so as to accomodate at least one layer of cigarettes (S), characterized by the fact that said shell (1) presents at its periphery four flat edges (101) three of which are arranged co-planar to one another, while the remaining fourth edge (101'), which is adjacent to one of the rows of the ends of the cigarettes, is arranged at a lower level, and the two edges (101) adjoining to said lower edge (101') are connected to same by means of inclined edge portions (101"), and on said four edges (101,101',101") there is perimetrically secured a sheet covering (5) which can be torn away at least at a portion (105) which is adjacent to the said lower edge (101').

2) A package according to claim 1, characterized by the fact that the length of the parallel horizontal edges (101) adjoining to the lower level edge (101') is greater than the length of the cigarettes (S) accomodated in the shell (1), whereby the sheet covering (5) will not deform the ends of the cigarettes at said lower level edge (101').

3) A package according to claim 1, characterized by the fact that the said lower level edge (101') is located at a level slightly above the bottom of the shell.

4) A package according to claim 1, characterized by the fact that the said lower level edge (101') is co--planar with the bottom of the shell.

5) A package according to claim 4, characterized by the fact that the bottom of the shell is provided, near to the said lower level edge (101') and parallel thereto, with a raised rib (201) or with a series of longitudinally aligned ribs, serving as abutment for the ends of the cigarettes (S).

6) A package according to claim 1, characterized by the fact that the covering sheet (5) is made of aluminium.

7) A package according to claim 1, characterized by the fact that the bottom of the shell is provided with channel-shaped seats (3), each seat accomodating at least one portion of a cigarette (S).

8) A package according to claim 7, characterized by the fact that the said channel-shaped seats (3) are of such a length as to accomodate only one portion of the cigarettes, whereby the remaining flat portion of the outer bottom surface of the shell carries printed or anyhow affixed thereon any information, such as trade marks identifying the product, or advertising messages.

9) A package according to claim 1, characterized by the fact that the outer surface of the sheet covering

(5) carries printed or anyhow affixed thereon any information, such as trade marks or advertising messages.

10) A package according to claim 1, characterized by the fact of comprising a single shell, and a protection lid (11) adapted to be removably applied on said shell by snap fitting, so as to overlap said sheet covering (5).

11) A package according to claim 10, characterized by the fact that said protection lid (11) if formed integrally with the shell (1) and is connected thereto along a hinge line (2).

12) A package according to claim 1, characterized by the fact of comprising two shells (1,1') said shells being connected to each other along a hinge line (2) whereby the said two shells may be folded, in a book-like manner, the one over the other, and snap fastener means (8,9,10) are further provided on at least two mutually facing edges of the two shells, so as to maintain the package in closed folded condition.

13) A package according to claim 1, characterized by the fact that a portion of the periphery of said sheet covering (5) is not entirely secured to the edge of the shell, and suitable notches or weakening lines may be provided at said non-secured portion, so as to define at least one tab (L) to be used for tearing off the covering (5).

14) A package according to claim 1, characterized by the fact that at least one pull tape (6) is provided on the sheet covering (5) parallelly to the lower level edge (101') and in proximity thereto, to be used for tearing off the said covering (5).

15) A method for manufacturing packages for cigarettes, cigars or the like, in accordance with claim 1, characterized by the fact of comprising the following steps:

a) formation of the shells (1 or 1-1') preferably by thermoforming of a continuous sheet of plastics material;

b) filling of the shells with at least one row of aligned cigarettes (S);

c) closure of the shells by means of a sheet covering (5) perimetrically secured to the edges of the shells;

d) blanking operation in order to separate the filled and closed shells from the continuous sheet from which they have been made.

16) A method according to claim 15, characterized by the fact of further applying a closure lid, in case of a package formed by one single shell.

17) A method according to claim 15, characterized by the fact folding over the two shells, in case of a package formed by two hinged shells, or folding over the lid, in case of a package formed by one single shell with a protection lid hinged thereto.

18) A method according to claim 15, characterized by the fact that the sheet covering (5) is secured to the edges of the shell by heat-sealing.

19) A method according to claim 15, characterized by the fact of applying, together with the sheet covering (5) at least one pull tape (6).

20) A method according to claim 15, characterized by the fact of finally packing the finished packages to form cartons.

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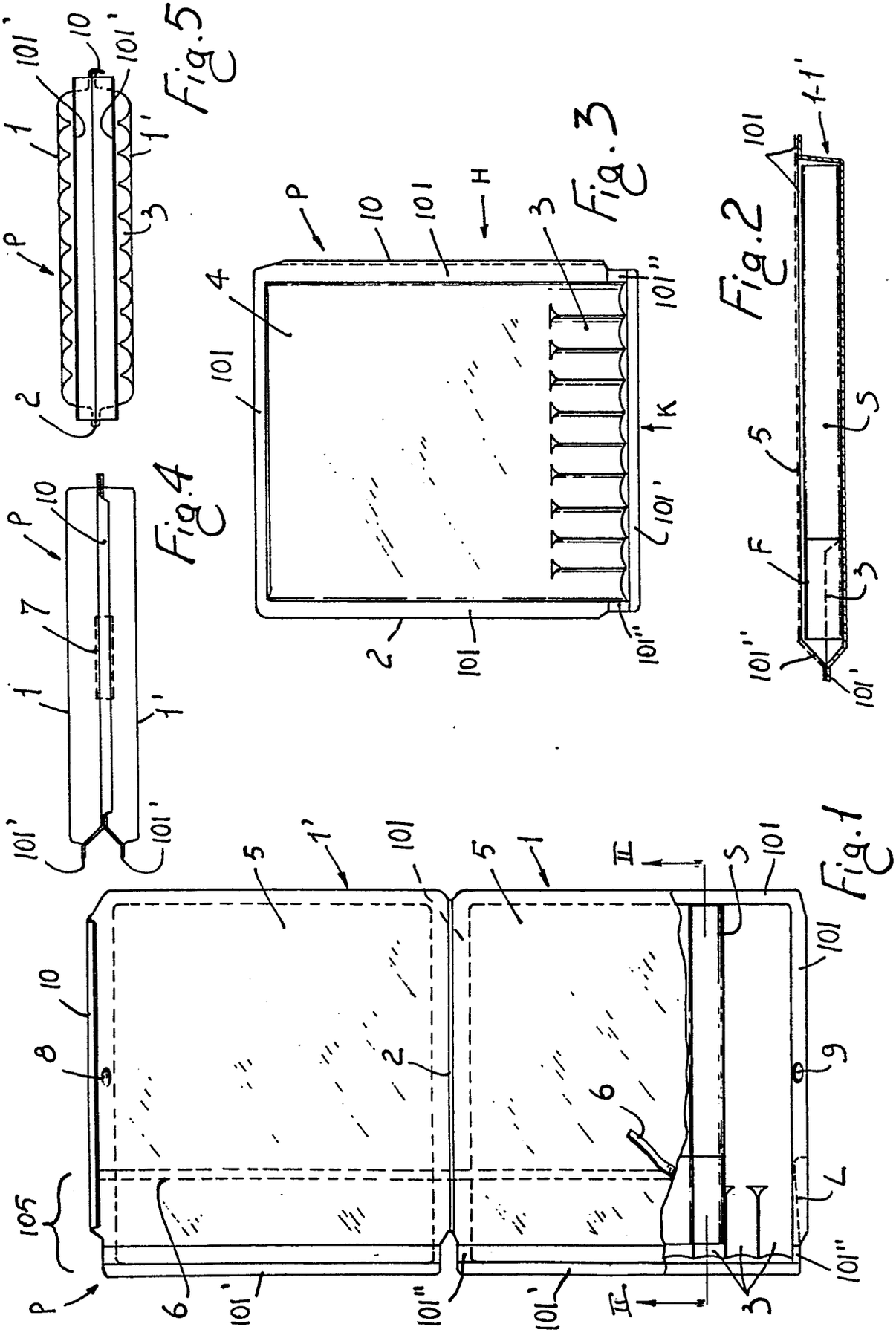
Fig.1
Fig.2
Fig.3
Fig.4
Fig.5
P
10
101
101'
101''
1
1'
2
3
4
5
6
7
8
9
105
II
III
H
K
F
L
1-1'

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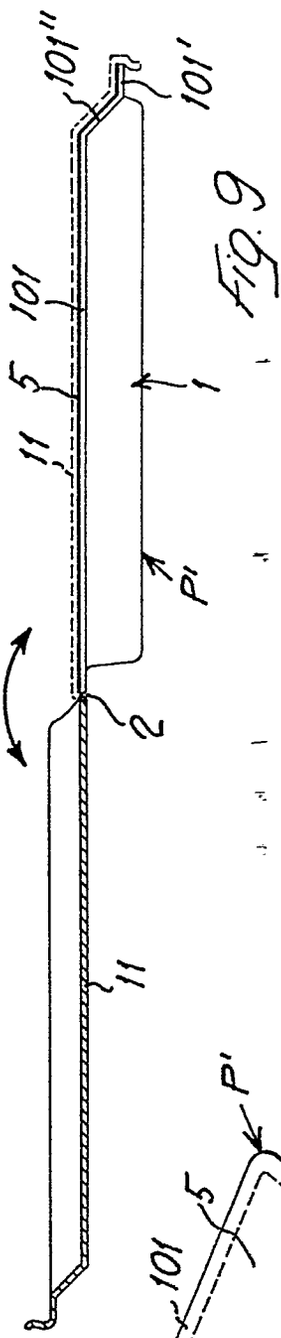

Fig. 9

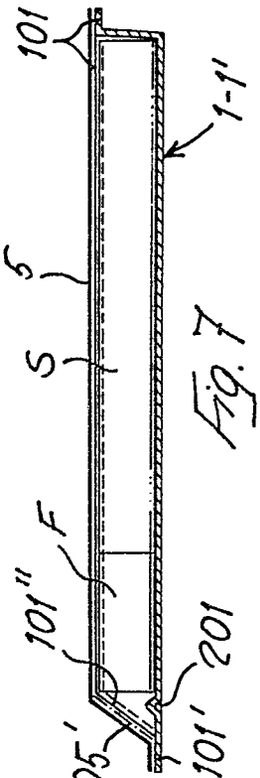

Fig. 7

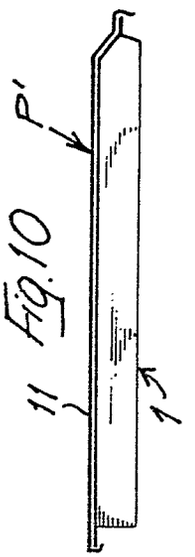

Fig. 10

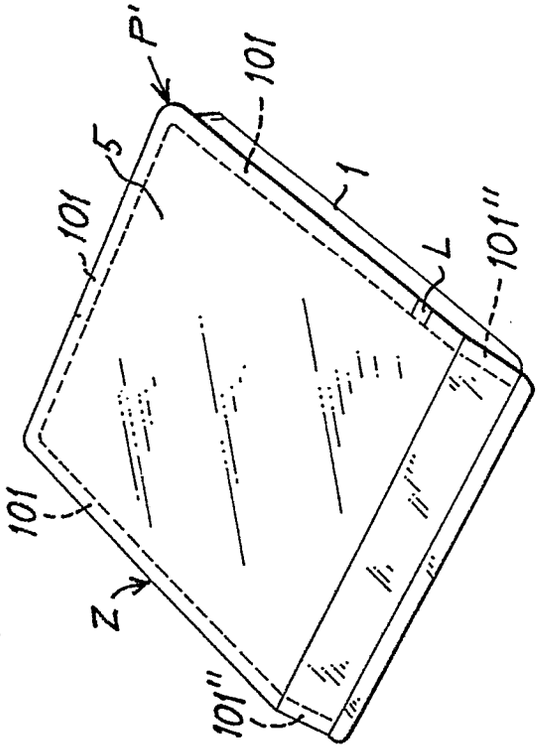

Fig. 8

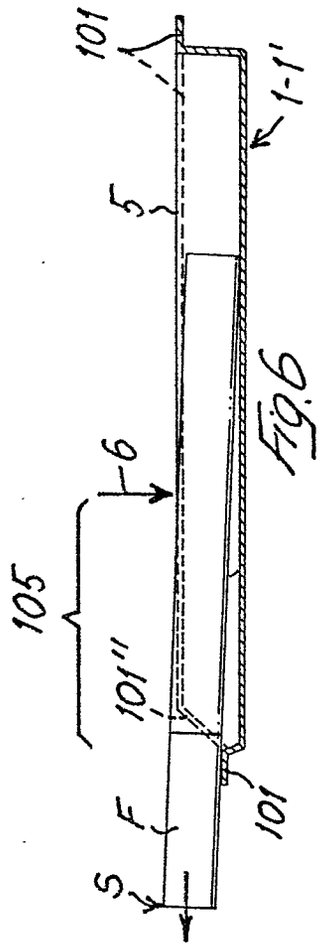

Fig. 6

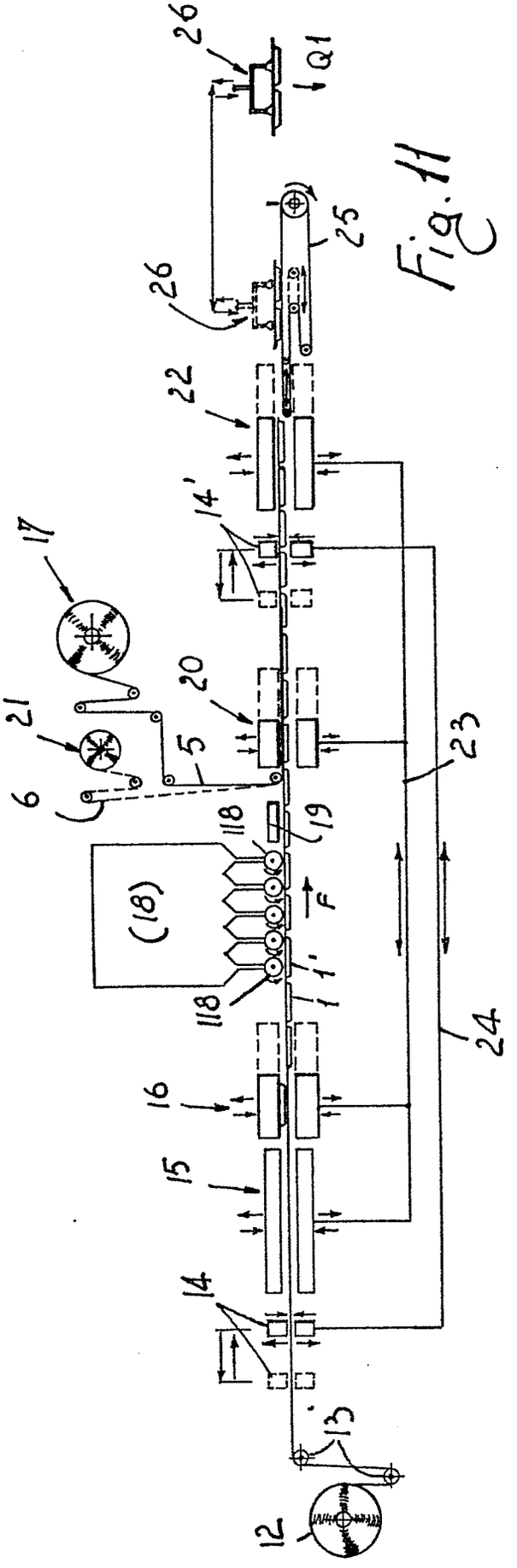
26
Q1
25
26
22
14'
17
20
21
5
6
23
118
19
(18)
F
1'
118
24
16
15
14
13
12

Fig. 11

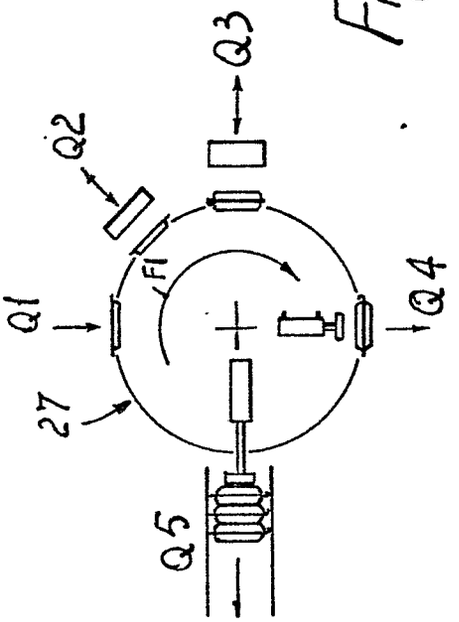
Q2
Q3
F1
Q1
Q4
27
Q5

Fig. 12