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Rausing

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[54] **METHOD FOR THE PACKING UNDER ASEPTIC CONDITIONS OF STERILE GOODS INTO CONTAINERS**

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[51] **Int. Cl.²** **B65B 31/02;** B65B 55/18

[58] **Field of Search** ..... 53/167, 184, 21 FC, 110

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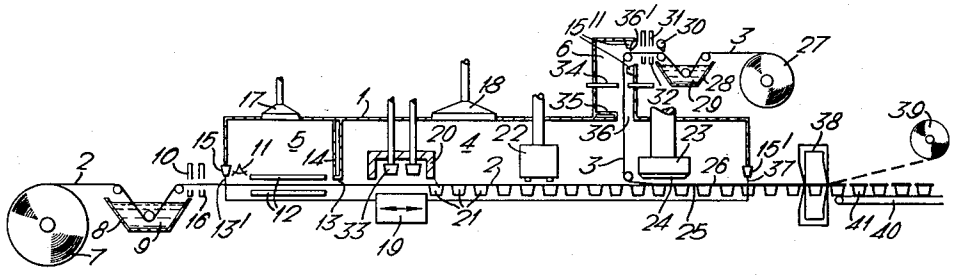
[57] **ABSTRACT**

A method for packing sterile goods into containers under aseptic conditions wherein a thermoformable web is introduced into one end of a processing tunnel within which sterile conditions are maintained. As the web passes through the tunnel it is drawn into a series of end-to-end connected open-top containers which are then filled from above with the sterile goods to be packaged. After filling, and while still within the tunnel, a closure in the form of a second web is applied to the upper ends of the containers and heat sealed into place. After the end-to-end connected formed, filled and sealed containers pass out of the opposite end of the tunnel they are then separated from one another by severing.

3 Claims, 6 Drawing Figures



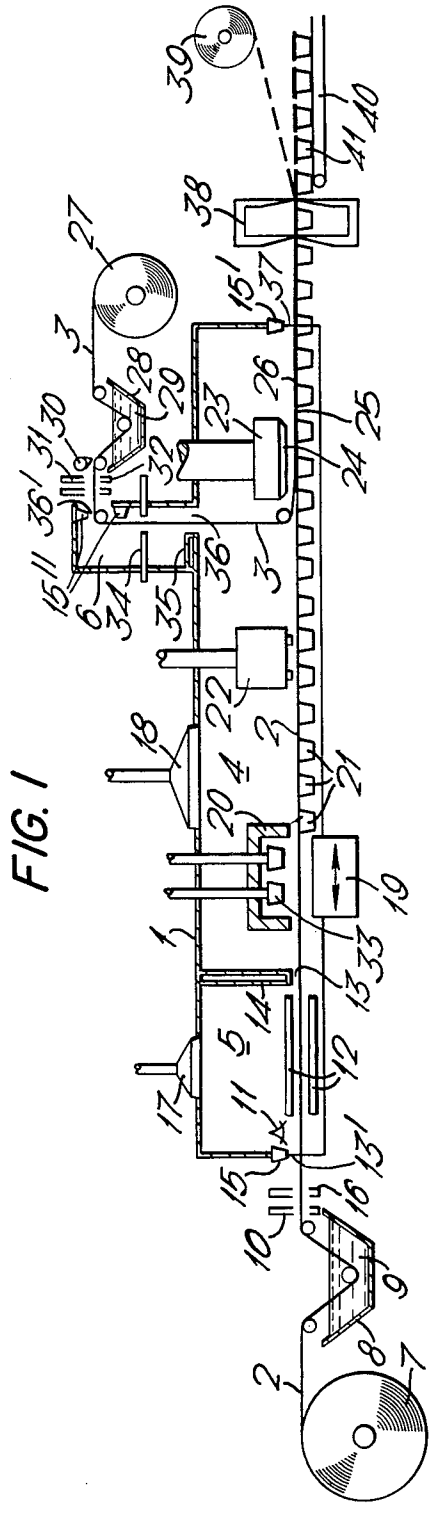


FIG. 1

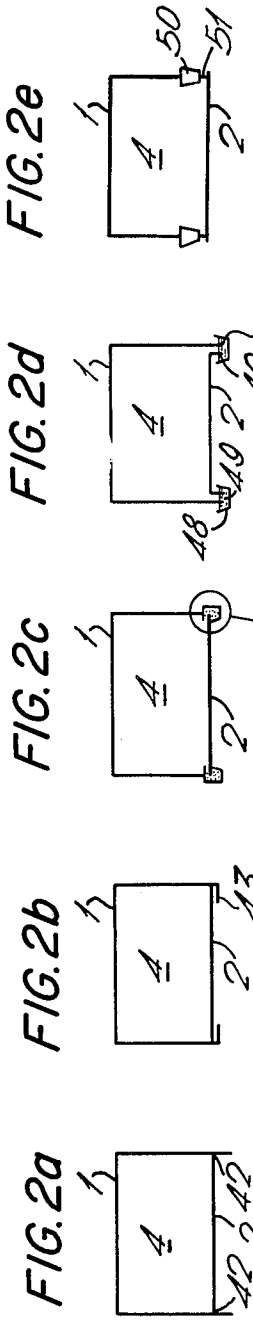


FIG. 2a FIG. 2b FIG. 2c FIG. 2d FIG. 2e

METHOD FOR THE PACKING UNDER ASEPTIC CONDITIONS OF STERILE GOODS INTO CONTAINERS

The present invention relates to a method for the packing under aseptic conditions of sterile goods into cntainers, a thermoformable material web, after it has been subjected to a sterilizing medium or with simultaneous sterilization, being heated up to a temperature required for a thermoforming processing, whereupon the web or a selected part of the same is subjected to a thermoforming processing with the object of forming containers from the web, which whilst continuing to be joined to the web and being oriented so that the container openings are situated mainly in the plane of the web, are filled with the sterile goods intended for packing and are closed in that the openings of the container are covered by another web, which is sealed or in some other manner joined to the first material web at least along zones closed in themselves around the container openings with the object of enclosing the sterile goods in the containers.

In packing technology and especially in packing procedures for such goods which normally have limited keeping properties, attention is directed more and more towards an improvement of already existing packing systems or to bringing out new ones which would allow a prolonged keeping quality for the goods packed. By the application of such packing systems it is intended first and foremost that the goods should be able to permit a normal distribution, storage and keeping until the time of consumption. Demands can be made therefore not only on the form and special treatment of the goods themselves with regard to their keeping quality, but also on the manner of packaging them, likewise on the packing container and its material composition. Dairy products for example constitute such goods which are referred to here and packing systems also exist suitable for the aseptic packing of these products in consumer packages.

In one of the known rational methods for the packing of sterile goods under aseptic conditions so as to make possible a prolonged keeping quality of the goods, a compound material web is used which comprises a fibrous base layer and plastic layer and metal foil layer placed thereon. The web is converted to a tube which is filled with the sterile goods and which is divided under aseptic conditions to wholly filled and closed packing units. In another system prefabricated, closed and sterile containers are punctured with a cannula, through which the sterile goods are fed to the interior of these containers. This system of packing is of course not rational for the packing of such consumption goods as foodstuffs. In another packing system a web of plastic material is used, from which containers are formed by means of vacuum drawing, at least the filling and closing operations being carried out in an aseptic atmosphere.

By the very fact that new plastic materials or combinations of plastic material appear, which present an improved resistance against penetration of gas and water vapour, possibilities exist now for the manufacturing of sterile packages consisting of plastic material only. In this connection modifications or improvements of already existing packing methods have been suggesed, where a plastic material is used for the forming of the packing container. In these methods container bodies are often formed by vacuum drawing from a plastic material web heated in advance, whereupon the containers are filled with the goods intended for packaging in that for example wafers are applied to cover the openings of the filled containers, which wafers are sealed to the opening rim of the container or to the area close by it. So as to obtain a sterile environment when packing a sterile material certain parts of the device, such as the filling and closing elements, have been built into or have been enclosed in a chamber, wherein a largely sterile atmosphere is maintained.

In such packing machines, however, certain problems exist with regard to the maintenance of sterility in the socalled sterile chamber, which are due to the fact that already existing machines and systems have not been fully adapted to the new circumstances. Furthermore, the form and size of the sterile chamber necessary for these types of machines have been unnecessarily complicated and voluminous.

By means of the present invention, however, a method is suggested which is adapted to a rational packing procedure for a sterile material filled and where aseptic conditions can satisfactorily be maintained at the same time as such problems and inconveniences which were mentioned above can be overcome. The invention is characterized in that a first thermoformable material web is introduced into a tunnel and is passed through the same in such a manner that the material web, together with the walls of the tunnel, forms a chamber, in which a sterile atmosphere is maintained, the filling of the containers formed and the sealing of the filled containers are carried out with the help of a second material web in the said chamber, whereupon the filled and sealed containers are moved out of the tunnel while the combined first and second webs present a plane upper side, and that the containers are finally separated from one another by means of a cut through the said two webs.

In the following the invention will be described with reference to the enclosed schematic drawing, wherein

FIG. **1** shows in side view and partly in section a set-up for the execution of the method in accordance with the invention and

FIG. **2***a*-FIG. **2***e* show in cross-section various executions of the sterile tunnel which forms part of the set-up according to FIG. **1**.

In FIG. **1** reference indication **1** indicates a tunnel and **2** a thermoformable material web which is intended to be introduced into the one end of the tunnel and to be moved out from its other end together with a second material web **3**, which is applied to the first thermoformable material web in the tunnel. The walls of the tunnel **1** form, together with the web **2** and the joined first and second webs **2** and **3**, a sterile chamber **4**. The sterile chamber can be provided at its front end with a pre-treatment chamber **5**, which may consist of an extended part of the tunnel **1**, this chamber being formed similar to the sterile chamber **4**, that it to say that the walls of the tunnel together with the web **2** form the chamber. A pre-treatment chamber **6** is arranged for the introduction of the said material web **3**. This chamber is realized preferably as a superstructure on the sterile tunnel **1** and communicates with the same via an opening **36** in the tunnel wall.

Underneath the sterile chamber **4** a forming tool **19** is arranged for the forming of container bodies **21** by means of thermoforming processing of the material web **2**. The forming tool may consist of a forming box

which comprises at least one, but preferably several forming cavities and which is adapted for example for vacuum drawing of the material web **2.** Moreover, the forming box is adapted so that it can follow the web some distance in the direction of movement of the same during the forming operation itself, thereafter rapidly to revert to the original position for the processing of a nonprocessed part of the web. Instead of a forming box the forming tool may consist of a number of forming bodies which are designed for the same purpose as the said forming box, the forming bodies being arranged so that they run on an endless chain underneath the material web **2.** In the case of such an arrangement the containers formed in the forming bodies can be allowed to remain in the forming cavity of the forming bodies for an appreciably longer time than what is possible otherwise for a rational forming process. In the course of this the container bodies can cool down in the forming cavity without special cooling having to be applied and also better conditions for a prevention of a shrinkage of the material being obtained. Furthermore, in this manner the thermoformable material web **2** is given a necessary push up during the transport through the sterile chamber **4** as well as a support at the different working operations.

On the side opposite the thermoformable material web **2,** that is to say in the sterile chamber **4,** a tool **20** may be arranged for a positive forming effect on the material web **2.** In the sterile chamber **4** there is also a filler **22,** which is adapted so that it fills the container bodies **21** with sterile goods. Furthermore, a sealing device **23** is provided in the chamber **4,** which for example by means of heat and pressure and by means of compression plates **24** seals the said second web **3** to the material web **2,** so that the sterile goods filled into the container bodies **21** becomes enclosed. In the upper part of the tunnel **1** is an intake **18** for sterile air, which air is introduced into the sterile chamber **4** and is contained in the same, preferably under a certain pressure.

Before the thermoformable material web **2** is subjected to a thermoforming processing by means of the forming tools **19, 20,** the material web has to be heated up to a temperature necessary for the thermoforming processing, that is to say to a suitable degree of softening. This heeating operation is carried out appropriately outside the sterile chamber **4,** because the sterile atmosphere contained in the chamber may become mixed with medium evaporating off the web. In FIG. **1** the heating elements are indicated by reference numeral **12,** which are arranged outside the sterile chamber **4.** These heating elements may consist for example of heating spirals designed for electric heating. The heating operation may be carried out, as shown in the figure, in a chamber, which in turn may consist of the said pre-treatment chamber. The upper part of the pretreatment chamber **5** may be provided with an element **17** for extracting by suction the atmosphere contained in the chamber. Furthermore, the pre-treatment chamber may be provided instead or at the same time with different elements for the washing and/or sterilization of the material web **2.**

The said pre-treatment chambers **5** and **6** are intended foremost to contain elements for the cleaning of the two respective material webs **2, 3** by means of washing and/or sterilizing before they are introduced into the sterile chamber **4.** The element **11** may be adapted so as to irradiate the webs with ultraviolet light, the element **4** for electron spraying of the webs or bath and spray devices containing hydrogen peroxide, alcohol or some other sterilizing, washing or disinfecting fluid which is kept in the bath or which is applied to the webs in the form f finely divided particles. Traces of such liquid medium can be removed from the webs by evaporation, suitable heating elements for the purpose being arranged in chambers **5, 6.** By means of these heating elements or by means of the said elements **12** provided for the heating of the material web **2** to the required thermoforming processing temperature, the web can be subjected to a thermal sterilization. In both the pre-treatment chambers **5** and **6** sterile atmospheres are of course being maintained for this purpose and suitable delimitations exist against the atmosphere surrounding the chambers.

For the introduction of the two material webs **2** and **3** into the sterile tunnel **1** or the pre-treatment chambers **5, 6** and for the passing out from the sterile tunnel of the combined first and second webs **2** and **3,** the elements **15, 15'** and **15''** are provided at the entrance **13, 13', 36, 36'** and at the exit **37** respectively, which prevent the surrounding atmosphere from penetrating into the tunnel **1** and/or the chambers **5** and **6.** These elements may consist of a sluice comprising a suitble sterilizing or disinfecting fluid, an air curtain consisting of a sterile air stream, a liquid curtain consisting of finely divided particles of hydrogen peroxide, alcohol or a washing or disinfecting, non-corrosive liquid, a sleeve element or any other means which prevents the surrounding atmosphere from penetrating into the tunnel and/or the chambers.

The pre-treatment chambers **5** and **6** respectively must be separated from the sterile chamber, which can be done in the simplest form by a screen wall **14** and **35** respectively, the pressure of sterile air prevailing in the sterile chamber **4** being made to flow out to the pretreatment chambers through the openings **13** and **36** respectively which are arranged between the screen walls and the material webs **2** and **3** respectively. The pre-treatment chambers can also be separated from the sterile chamber by means of a sluice, a liquid or air curtain or any other suitable arrangement.

The washing and/or sterilization process must be carried out outside the sterile chamber **4.** If liquid or gaseous washing and/or sterilization agents are used, the said processes must likewise be carried out outside the pre-treatment chambers **5, 6,** since the agents, if used in the pre-treatment chambers, may be blended into the atmosphere contained in the chambers and there is an obvious danger, in spite of the presence of sluices or similar arrangements between the pre-treatment chambers and the sterile chamber, that the atmosphere mixed with washing and/or sterilization agents may penetrate into the sterile chamber **4** or that such agents may precipitate in liquid form (condensation) on the material web to accompany the same into the sterile chamber.

As can be seen in FIG. **1,** vats **8** and **28** are arranged outside the pretreatment chambers **5** and **6** respectively. These vats are intended to contain a washing and/or sterilizing liquid **9** and **29** respectively for the material webs **2** and **3,** consisting for example of an alcohol or a hydrogen peroxide solution. Behind the tanks are arranged elements **10** and **31** respectively for the absorption of the surplus liquid and heating ele-

ments **16** and **32** respectively in the form of for example heating spirals for the heating of the respective web so that the residues of the treatment fluids evaporate. For the removal of the surplus fluid it is also possible for example to use an air knife, such as that indicated in FIG. **1** by numeral **30,** with the surplus liquid flowing or dripping back into the vat **28.**

Outside the exit of the sterile chamber **4** is arranged a knife or shear element **38,** which is intended to separate the filled and sealed containers from one another by means of a cut through the two material webs **2** and **3.** Possible surplus material from the said second material web **3** may be rolled up on a roller **39.** An endless belt **40** or another suitable transport device is arranged for taking over the separated packing containers **41.**

In FIG. **2***a*—FIG. **2***e* there is shown a cross-section of the sterile chamber **4** in different manners of realization. The figures show, that the sterile chamber consists on the one hand of the said tunnel **1,** on the other hand of the thermoformable material web **2** which constitutes the bottom of the sterile chamber. Since the sterile chamber consists of two parts movable in relation to one another, a seal has to be provided between the parts which is satisfactory in respect of the aseptic conditions. According to FIG. **2***a* it is intended that the pressure prevailing in the sterile chamber **4** shall be allowed to seep out in the cracks **42** which have to be maintained between the longitudinal edges of the web **2** and the side walls of the tunnel **1.**

FIG. **2** *b* differs from FIG. **2** *a* only in that the bottom portions of the wall **43** have been folded-in a bit under the thermoformable material web **2** so as to form a better protection against the surrounding atmosphere. According to FIG. **2***c* the longitudinal edges of the thermoformable material web **2** are allowed to run in a liquid **45** which is contained in a channel **44** running along each web edge. Each of the channels can be constructed as a container closed in itself which has, however, a longitudinal opening matched to the web edges, so that the respective longitudinal edge portions of the web can project into an adjacent channel **44.** With the object of achieving a seal the said opening in each channel can be provided with sleeves or the like. In the manner of realization shown in FIG. **2***d*, the longitudinal web edges of the thermoformable material web **2** likewise run in a liquid **49.** Here too the liquid is contained in elongated channels or containers **48** which are arranged adjoining to the web edges. In this case, however, the edge portions on the material web have been folded over in such a manner that from the horizontally guided web, edge flanges **46** largely extending vertically downwards, are obtained. Here the bottom portions of the side walls **47** of the tunnel are also allowed to dip into the same liquid, as a result of which a liquid sluice is formed between the walls of the tunnel and the longitudinal edge portions of the thermoformable material web. According to FIG. **2***e* the side walls of the tunnel **1** are allowed to extend to a position just above the longitudinal edge portions of the material web **2,** so that preferably only the necessary slits **51** between the tunnel walls and the material web are obtained. The web must then have a width which at least corresponds to the width of the tunnel, but which preferably somewhat exceeds the width of the latter, so that the sterile chamber **4** can be sealed in a satisfactory manner against the surrounding atmosphere. Reference numeral **50** indicates the element for the formation of a liquid or preferably air curtain as a screening agent. Different types of sleeves, or any other element, are also conceivable as screening agent in this context.

The thermoformable material web **2** may consist of a polyvinylidene chloride-coated polyvinylchloride web, a polyvinylidene chloride-coated polystyrene web, a co-extruded web consisting of a polyethylene-polyvinylidene chloride-polyethylene combination, an acrylonitrile copolymer built up of polystyrene-polyvinylidene chloride-polyethylene. Other combinations may of course also be used in the building up of a thermoformable material web which can be used in this connection. Thus two or more of the following materials, namely polystyrene, polyvinylidene chloride, polyethylene, polyvinylchloride and also aluminium foil can be combined. The said second material web **3** may be built up of a multi-layer material consisting of a metal foil, a polyethylene layer, a more rigid layer consisting of fibres or polyester and a preoxylene-based coating which is heat-sealable. Other material compositions are of course conceivable.

When applying the set-up described, the following procedure is observed. Before the forming and filling process itself is started, the sterile chamber **4** and the pre-treatment chambers **5** and **6,** if such are used, must be set up, which is done in that at least the thermoformable plastic material web **2** is introduced into the tunnel **1.** Subsequently the sterile chamber and the pre-treatment chambers **5, 6,** if any, have to be sterilized and/or disinfected, which implies that the elements situated in the sterile chamber, such as the forming elements **20,** the fillers **22** and so on become washed and sterilized.

In the course of the packing, as can be seen from FIG. **1,** the thermoformable material web **2** is passed from a roller **7** and down into a vat **8** containing a washing and/or sterilizing liquid **9** for the purpose of cleaning or washing and sterilizing the material web **2.** After the vat **8** the surplus liquid is absorbed or removed in some other manner from the web **2** by means of the element **10** designed for this purpose. Usually this is followed by a heating of the web by means of the heating element **16** shown, so that any residues of the treatment liquids evaporate. After these operations the thermoformable material web **2** would be ready to be introduced into the sterile chamber. As mentioned earlier, however, the web has to be heated to the required thermoforming processing temperature before it is introduced into the sterile chamber. In this case the heating elements intended for this are arranged in the vicinity of the inlet opening **13** of the sterile chamber, so that the web is strongly heated when it is introduced into the chamber, the heating operation acting as a disinfecting sluice for the entrance of the web into the sterile chamber. The said special heating element **16** for the drying of the web would then probably be omitted.

In accordance with the embodiment shown in the figure, however, the thermoformable material web **2** is introduced into the sterile tunnel **1** after cleaning and drying operations. The web is introduced into the sterile tunnel in a preferably horizontal plane and in a substantially even layer. At this entrance into the tunnel the web is passed through or via a sluice or some other element which is arranged so as to delimit the sterile chamber against the surrounding atmosphere. If the material web is introduced, as mentioned, in an even layer and substantially horizontally, the element delim-

iting against the environment may consist simply of a vertically directed curtain consisting of sterile air. The curtain will then form an extension of the end wall of the sterile tunnel 1.

The front part of the sterile chamber 4 is realized according to FIG. 1 as a pre-treatment chamber, where the web 2 can be subjected to a sterilizing and/or disinfecting effect by means of different elements or agents. This pretreatment chamber 5 may also be arranged for the heating of the material web 2 to the necessary thermoforming processing temperature, the material web 2 being subjected in this same heating process to a thermal sterilization. The material web 2 thus passes after entrance into the sterile tunnel 1 an element 11 which may be provided for subjecting the web to electron spraying and/or ultraviolet light for the purpose of disinfecting and/or sterilizing the web before being introduced into the sterile chamber 4. Furthermore, the material web 2, before being introduced into the sterile chamber, passes the heating element 12, where the web is heated up to the temperature required for thermoforming processing. If the web is to be formed with folded over edge portions 46 in accordance with the sterile chamber design as shown in FIG. 2*d*, it will be appropriate to carry out this folding-over operation in connection with, or after, the said heating operation.

When the material web has a degree of softening suitable for the thermoforming processing, it is introduced into the sterile chamber itself. The sterile chamber 4 is delimited against the pre-treatment chamber 5 in such a manner that the atmosphere maintained in the pretreatment chamber should not be able to penetrate into the sterile chamber. By keeping the atmosphere maintained in the sterile chamber 4 under pressure, the delimitation between the chamber may consist simply of a single screen wall 14 or the like, as shown in the figure, the material web being introduced into the sterile chamber through the inlet opening 13.

The material web 2 thus heated to softening is subjected subsequently to the thermoforming processing by means of the forming elements 19 and/or 20 with the object of forming container bodies 21, which in a later stage are filled with the sterile goods intended for packaging by means of the fillers 22 shown. After the containers have been filled they must be sealed, which is done by applying the said second material web 3 to the thermoformable material web 2 so that it is wholly covered.

As can be seen from FIG. 1 the said second material web 3 is passed down from a roller 27 into a vat 28 which contains a cleaning, washing and/or sterilizing liquid similarly to the set-up for the treatment of the first thermoformable material web 2. After the web 3 has passed the vat 28, the surplus fluid is drawn off the web by means of the air knife 30 shown or by an absorbing element 31. Subsequently the web passes a heating element 32, whereby any residual traces of the treatment fluids are evaporated. The material web 3 is then introduced into the pre-treatment chamber 6 through its opening 36'. In the opening the web passes the element 15'' which is intended to form a sluice or a curtain, so that the atmosphere surrounding the chamber cannot penetrate into the chamber. If the material web is introduced into the pre-treatment chamber in a substantially horizontal or vertical position and the web presents substantially even surfaces, the said element may be designed for the production of a vertical or horizontal sterile air curtain or air seal, which fills out the interspace between the walls of the chamber and the surface of the material web. In the pretreatment chamber 6 the material web 3 passes further various elements 34 for the disinfection and/or sterilization of the web, whereby it is possible, as mentioned earlier, for the elements to be arranged so as to subject the web to electron spraying and/or ultraviolet light. Subsequently, the material web 3 is introduced into the sterile chamber 4 to be joined to the first thermoformable material web 2. The web 3 passes through an opening 36 in the wall of the sterile tunnel 1. This pretreatment chamber 6, similar to the other pretreatment chamber 5, is separated from the sterile chambeer 4 by means of a screen wall 35 or the like.

The said second material web 3 is applied and sealed to, or joined in some other manner to, the first thermoformable material web, and this is done at least along zones closed in themselves around the openings on the container bodies 21 formed in the material web, so that the sterile goods filled into the containers are enclosed. The sealing or closures are done for example by means of heat and pressure with the tool 23 shown in the figure. The material web 3 applied is fitted so that it preferably wholly covers the thermoformable material web 2 and forms a substantially even upper side on this web. The container bodies 21 so sealed are then passed out of the sterile tunnel 1 whilst they continue to be attached to one another, and form a substantially even surface towards the tunnel or the chamber.

On leaving the sterile tunnel 1, the combined first and second material webs 2, 3 pass a curtain 15', a sluice or some other element which screens the opening or mouth 37 of the tunnel in such a manner, that the atmosphere existing outside the sterile chamber 4 cannot penetrate through the said opening. Since the thermoformable material web 2 has been given an even upper side through the application of the second material web 3 and in this case the combined first and second material webs 2, 3 are passed substantially horizontally out of the tunnel 1, the said curtain or sluice element 15' may consist of a device for the generation of a laminar, vertically directed sterile air stream which in the form of a curtain fills the space between the end wall of the tunnel 1 and the upper side of the combined webs.

After the formed, filled and sealed containers 21 have been passed out from the tunnel 1, they are separated from one another by means of knives or some other suitable element 38 in that the two said webs 2, 3 are cut through or severed between the container bodies formed, so that separate container units 41 are obtained. Any surplus of the said second and covering material web 3 can be rolled up on a roller 39. The separated containers 41 are removed lastly on a conveyor 40 for further treatment, for example for packing in transport containers, or the like.

Without exceeding the scope of the concept of the invention, modifications may be made to the process described. Thus it is quite possible to introduce into the sterile chamber 4 a gas actively sterilizing in itself instead of the said sterilizing air with the object of sterilizing or disinfecting the chamber and to maintain a sterile atmosphere in the same. In the packaging processes for foodstuffs sterilizing air is to be preferred, however.

Furthermore, the openings 13 and 36 between the sterile chamber 4 and the pre-treatment chambers 5

and 6 respectively, if any, may have special elements for the delimiting of the chambers from one another. Such elements may consist of a liquid seal filled with a suitable liquid, an air curtain consisting of a laminar, sterile air stream, a liquid curtain consisting of for example finely divided hydrogen peroxide or alcohol particles a sleeve element or some other means for preventing the atmosphere prevailing in the pre-treatment chambers from penetrating into the sterile chamber 4. The elements or agents mentioned here are specially applicable for the purpose of screening the sterile chamber 4 and the pre-treatment chambers 5, 6 in the limit zones of the same towards, or the inlet and outlet openings to, the atmosphere surrounding the chambers.

The said pre-treatment chambers 5, 6 may of course take the most suitable shape and they may thus be quite different from the design referred to in the description and shown in the figures. Thus they need not, as is the case in the pretreatment chamber 5 shown in FIG. 1, consist of partly a tunnel, partly a material web which in fact is intended for further processing to container bodies. It would also be possible, if this were found appropriate, and as pointed out earlier, wholly to eliminate the pre-treatment chambers 5, 6. The heating element 12 provided outside the sterile chamber 4 for the heating of the thermoformable material web 2 constitutes an advantageous treatment so that the material web should be able to be introduced directly into the sterile chamber. It is also conceivable, however, to allow the second material web 3 to pass a heated zone before or during its introduction into the sterile chamber 4, which means that in certain cases the pre-treatment chamber 6 could be discarded.

The material or combination of materials in the first and second material webs 2, 3 applied can of course be different from the ones suggested earlier. As a sole example may be mentioned that the said second and closing material web 3 may consist of simply a metal foil, for example an aluminium foil, which is coated possibly with for example a thermally active, adhesion promoting agent.

It must be emphasized, that it is essential, that the thermoformable material web 2, the said second material web 3 and/or the combined material webs 2, 3 are passed into and out of the sterile unit as limits to the surrounding atmosphere with a surface or upper side which is even, and that the web or webs are conveyed in an either substantially horizontal plane or vertical plane. Furthermore, it is essential that the said first material web 2 and/or the combined first and second material webs 2, 3 together with the sterile tunnel 1 form the said sterile chamber 4, that is to say that the material web and the combined webs 2, 3 constitute a side wall in the sterile chamber.

The configuration of the set-up shown in the figures on the outside of the said chambers 4, 5 and 6 is thus of less importance. For the sake of completeness it should be mentioned however, that the material webs 2 and 3 each by itself and in combined form are supported, guided etc. by means of guide rails, rolls or other suitable elements which in a satisfactory manner can bring the webs or the combined webs in the right position or positions during the various courses from the rolling off from the respective supply rollers 7, 27 and until the filled, sealed and separated containers 41 have been obtained. The invention is not limited therefore to the embodiment shown, but only by the following patent claims.

I claim:

1. A method for forming, filling and sealing containers under aseptic conditions from a first web of substantially impermeable thermoformable material of indeterminate length comprising moving the first web in the direction of its length with one surface facing a sterile chamber and cooperating therewith to constitute one outer wall thereof by forming a substantial seal therewith, forming a plurality of container elements in the first web, introducing a filler material into the container elements, applying a second web of substantially impermeable thermoformable material to the filled container elements, and sealing the second web to the first web to close and seal the filled container elements, the steps of forming the container elements, filling the container elements and applying and sealing the second web to the filled container elements being carried out while the first web constitutes the one outer wall of the sterile chamber and finally separating the filled and sealed containers after leaving the sterile chamber.

2. A method as claimed in claim 1 wherein the first web is sterilized before it forms the one wall of the sterile chamber.

3. A method as claimed in claim 1 wherein a sterile gas is passed into said sterile chamber under a pressure exceeding that of the surrounding air so as to prevent surrounding air from entering said sterile chamber.

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