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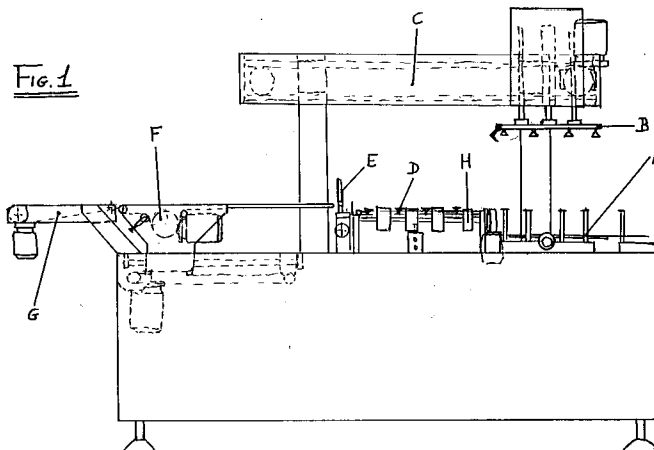
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Method and apparatus for the automatic bag packaging of hams, meats and food products in general.

A method and apparatus is described by means of which the automatic filling of casings with hams, meats and food products in general, without the product being touched manually by operators, for which one avoids any bacterial contamination and

spoiling of the appearance of the product, also saving on labour which until now has been necessary in this stage of the packaging process of food products.



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The present invention refers to the packaging of food products and more particularly of sausaged meats and in a specific way, cooked hams.

In the packaging of food products in protective, heatsealed, wrappers there is the problem of avoiding handling of products as far as possible to prevent bacterial contamination and spoiling of the external appearance for which one tends to realise packaging production lines which are as automatic as possible, where manual intervention is reduced to a minimum or if possible completely eliminated.

One of the principal polluting factors of these food products is constituted by free water which normally forms on the surfaces of vacuum-packed products. For this reason a surface treatment has recently been adopted in order to preserve animal products packaged in thermosealing equipment which consists of electrostatically depositing powdered gelatine on food products after their demoulding that is the extraction of said products from the forming mould.

During the demoulding stage the cooked hams come into contact with the operator's hands and the atmosphere: they can therefore be contaminated with various seriousness; in

Normally the operators who take more care with regard to the problem resolve the difficulty with a thermal treatment in autoclave at a temperature of about 120 degrees for a period of 15 minutes. It is evident that this system, although valid, represents an annoying constriction in the production line.

The powdered gelatine electrodeposition treatment of products has resolved this problem in an effective and efficient manner. The principle is based on the concept of saturation of free surface water by the function of the gelatine which has a great absorbing power (50 g of gelatine bind 1000 g of water).

The beneficial thermal action which develops by means of continuous pasteurisation is, at this point, sufficient to inhibit the bacterial load on the surface of the product and packaging, a bacterial load which, however, will find in the water bound to the gelatine an environment hostile to its development.

With this treatment one obtains the total elimination of the water in the packaging, the stabilisation and inhibition of bacterial action, a uniform treatment which is not visible on the surface of the product, with improvement of the qualitative standard and an easy insertion in the processing lines with a guarantee of normal working conditions.

However still unresolved is the problem of automatically inserting products so treated into packaging bags without them coming into contact with the operators, and subsequently sending them to the vacuum packaging heat-sealing machine,

and then to the continuous pasteurizer and to the carton machine before being stocked, ready for delivery and sale.

The solution of this problem consists of providing an automatic sausage bag packaging apparatus to be inserted into the packaging line downstream of the equipment for electro-deposition of gelatine on the food products.

This equipment must be provided with means which allow the packaging bags to be withdrawn one at a time from a supply, opened, filled with the gelatine treated food product and sent to the subsequent packaging phase, all without any manual operation on the product.

The method and apparatus according to the present invention is now described in greater detail with reference to a preferred embodiment, given only as an example and to be examined together with the appended sheets of illustrative drawings in which:

Figure 1 is an elevational view of the equipment, and

Figure 2 is a top plan view of said equipment.

Now with reference to the figures of the appended drawings, a brief description is provided here-with of the various units which constitute the apparatus, and one must emphasize the fact that each unit could be embodied with various component elements and equivalent parts, the function performed by each unit of the apparatus being especially important with respect to the invention, rather than its material structure considered as a combination of individual mechanical elements which, as stated, could also be constituted by different elements from those shown, provided that they are suitable for carrying out the same functions described herein.

The apparatus according to the invention is therefore constituted by the following units, in which the capital letters designating each unit correspond to the reference letters borne on the appended drawings.

(A) A magazine of empty bags, adjustable according to the format of the bags, driven by a pneumatic cylinder to allow a single bag to be taken up.

(B) A unit to withdraw empty bags one at a time, provided with suction cups and tongs driven by a pneumatic cylinder, necessary to guarantee the stability of the bag during transport. This unit is moved vertically by a pneumatic cylinder in order to open and maintain the mouth of the bag constant during filling.

(C) A motorized guide, onto which the withdrawing unit is fixed, necessary to move the empty bag from the magazine to the opening and product filling position.

(D) A bag opening unit, provided with suction

cups and tongs driven by a pneumatic cylinder, necessary to guarantee the stability of the bag during opening and product filling phase.

(E) Two conveyors, mounted on adjustable guides, driven by pneumatic cylinders, which widen the bag to the required dimension and also prevent any contact of the product with the internal area of the bag concerned by sealing with the packaging machine positioned downstream of the apparatus.

(F) An insertion conveyor belt fixed on a motorized transporter, which having received the product, unloads it into the inside of the bag.

(G) A conveyor belt to control the positioning and delivering of the product on to the insertion belt.

(H) A conveyor belt for moving the product inserted into the bag for the clearing of the subsequent working area in the packaging line.

An electric control board controlled by a microprocessor is provided for the driving and controlling of each single operation and movement, with the possibility of programming the functions with relation to the format of the products.

Hereinafter follows the operational description of the functioning of the apparatus, which illustrates its structure even better as well as its perfect adaptability to the functions required for the automatic carrying out of the packaging stages of the food products.

1) Arrival of the product on the feeder belt "G", with photocell controlled stop. Subsequent transfer onto insertion belt "F" and advancement of the product to its terminal part with photocell controlled stop.

2) Withdrawal of empty bags one at a time from magazine "A" by means of unit "B".

3) Closing of the bag blocking tong on withdrawal unit "B".

4) Transfer of withdrawal unit "B" by means of motorized guide "C".

5) Lowering of withdrawal unit "B" onto bag opening unit "D".

6) Raising of the withdrawal unit with contemporaneous blocking of the bag with the tongs.

7) When the desired opening position of the bag has been reached, two conveyors "E" are inserted which widen the bag to the required position and prevent contact of the product with the edges of the bag where the sealing must take place.

8) Advancement of the insertion belt "F" to the inside of the bag as far as the desired position by means of the transferer, subsequent direction change of the transferer and simultaneous advancement of the floor of the conveyor belt. This operation is carried out to place the product delicately and without scratching on the inside

of the bag.

9) Return to the initial position of all the movements for the starting of a new insertion cycle and advancement by means of a conveyor belt "H" of the product inserted in the bag for the clearing of the subsequent working area.

The working cycles occur automatically with controls determined by the condition of the packaging machine and the arrival of the product to be inserted. This automation is possible thanks to the adoption of a microprocessor (PLC) which controls and drives each individual operation and movement with the option of programming the functions with relation to the product format.

As already mentioned above, the principal advantages which are obtained using the in-line insertion of this automation apparatus are:

1) Labour saving, in that the operator only has the task of occasionally feeding the magazine with empty bags and programming the relevant format changes (an operation which is carried out in a short time, since the abovementioned registration are almost completely directed by the control board).

2) Lower contamination of the product to be packaged in that this does not come into contact with contaminating agents.

3) Improvement in the sealing results of the bag in that the areas to be sealed do not come into contact with any surface fat deposited on the product.

From the foregoing description of the currently preferred embodiment of the apparatus according to the present invention, it is therefore clear that the pre-established objects are fully achieved, however it must be emphasized again that numerous modifications, variations, additions and/or substitutions of the elements can be brought to the invention, without with this departing from either the spirit or object of the invention, and also without leaving its scope of protection, as is also defined in the appended claims.

Claims

1. Method for the automatic bag packaging of food products, characterized in that it comprises the operations of positioning the product by means of an inserter, ready for introduction into the bag; withdrawing one bag at a time from the appropriate feeding magazine and transferring it to the filling position; opening the bag and keeping it in an open position by means which prevent contact between the product and the closure edges of the bag; threading (moving) the insertion means into the open bag and introducing the product into said open bag; returning all the means to the start-

ing position for the beginning of a new cycle and simultaneously transferring the bag now filled with the product towards the subsequent packaging stages.

2. Method according to claim 1, characterized in that the production cycles are automatically controlled by means of a microprocessor which controls and drives each individual operation and movement with the option of programming the functions with relation to the format of the product. 5
3. Method according to claim 2, characterized in that the controls of the operating cycle are determined and directed by the ready condition of the subsequent equipment in the packaging line and the arrival of the product to be inserted on the insertion means. 10 15
4. Equipment for carrying out the method according to claim 1-3, characterized in that it comprises the following operative units: a magazine of empty bags; a unit for withdrawing one empty bag at a time from the store; a motorized guide onto which the withdrawing unit is fixed; a unit for opening the bag; two adjustable conveyors for widening the bag; a conveyor belt for insertion of the product into the open bag; a control conveyor belt for the positioning and delivery of the product on the insertion belt; a conveyor belt for sending the product inserted in the bag to the subsequent packaging phases; a microprocessor for the driving and control of each individual operation and movement. 20 25 30 35
5. Apparatus according to claim 4, characterized in that the magazine of empty bags is adjustable according to the format of the bags and is driven by a pneumatic cylinder to allow the taking up of each individual bag. 40
6. Apparatus according to claim 4, characterized in that the empty bag withdrawing unit is equipped with suction cups, tongs driven by a pneumatic cylinder, to guarantee the stability of the bag, and a pneumatic cylinder for moving the unit vertically to determine the opening of the mouth of the bag. 45 50
7. Apparatus according to claim 4, characterized in that the opening unit of the bag is provided with suction cups and tongs driven by a pneumatic cylinder to ensure the stability of the bag during opening and filling with the product. 55
8. Apparatus according to claim 4, characterized

in that the insertion conveyor belt is fixed to a motorized transfer means which moves the unit inserting it into the open bag to unload it on the inside of said bag, and at the end of the cycle it withdraws in to the position for receiving a new product from the product positioning and delivery control belt positioned before it.

9. Apparatus according to claim 4, characterized in that the conveyors are mounted on adjustable slits and are driven by pneumatic cylinders which widen the bag to the required dimension, preventing contact of the product with the mouth of the bag.
10. Apparatus for the automatic packaging of bags with hams, meats, sausages and food products in general, substantially as described hereinbefore and as shown in the figures on the appended sheets of illustrative drawings, for the objects specified above.

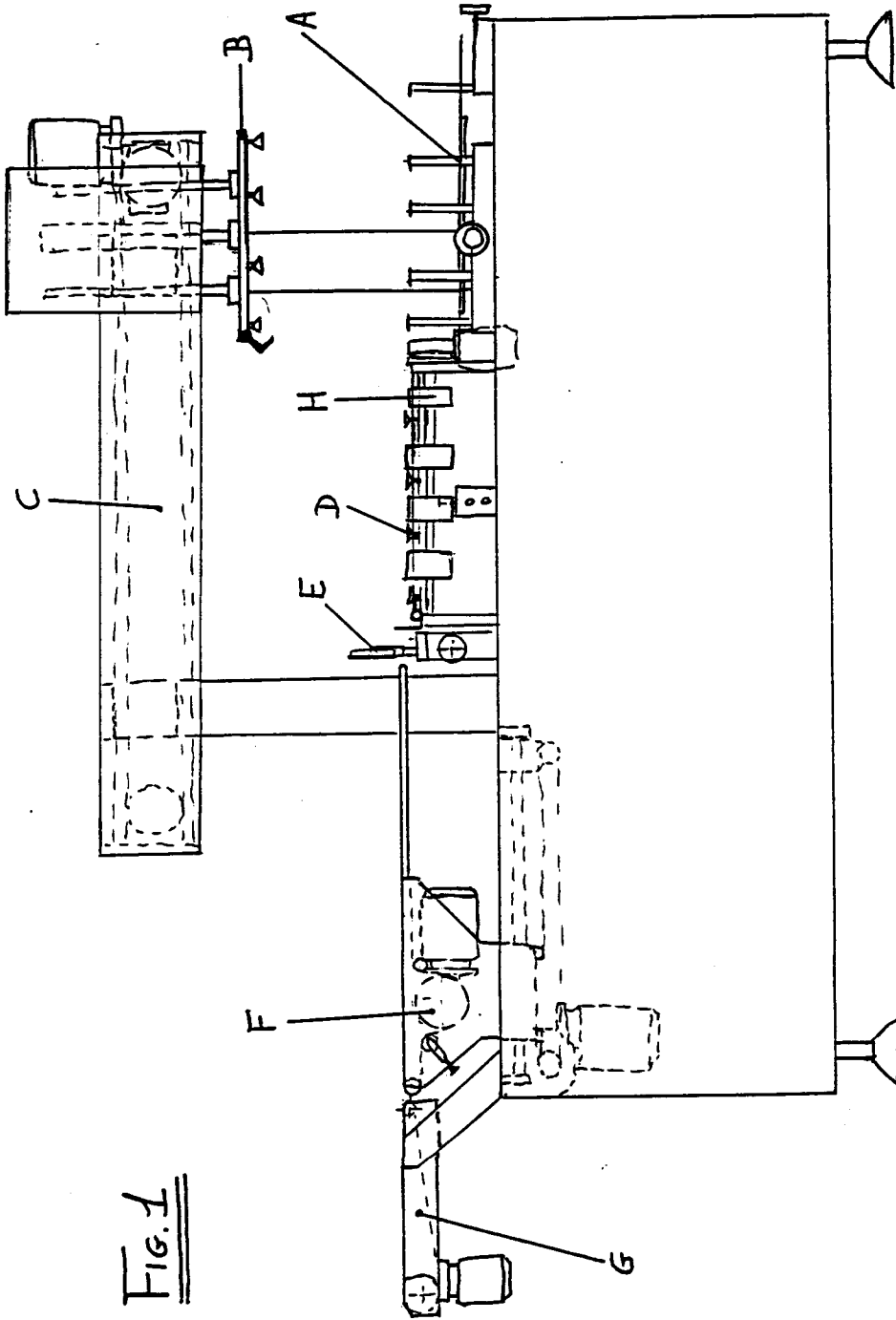


FIG. 1

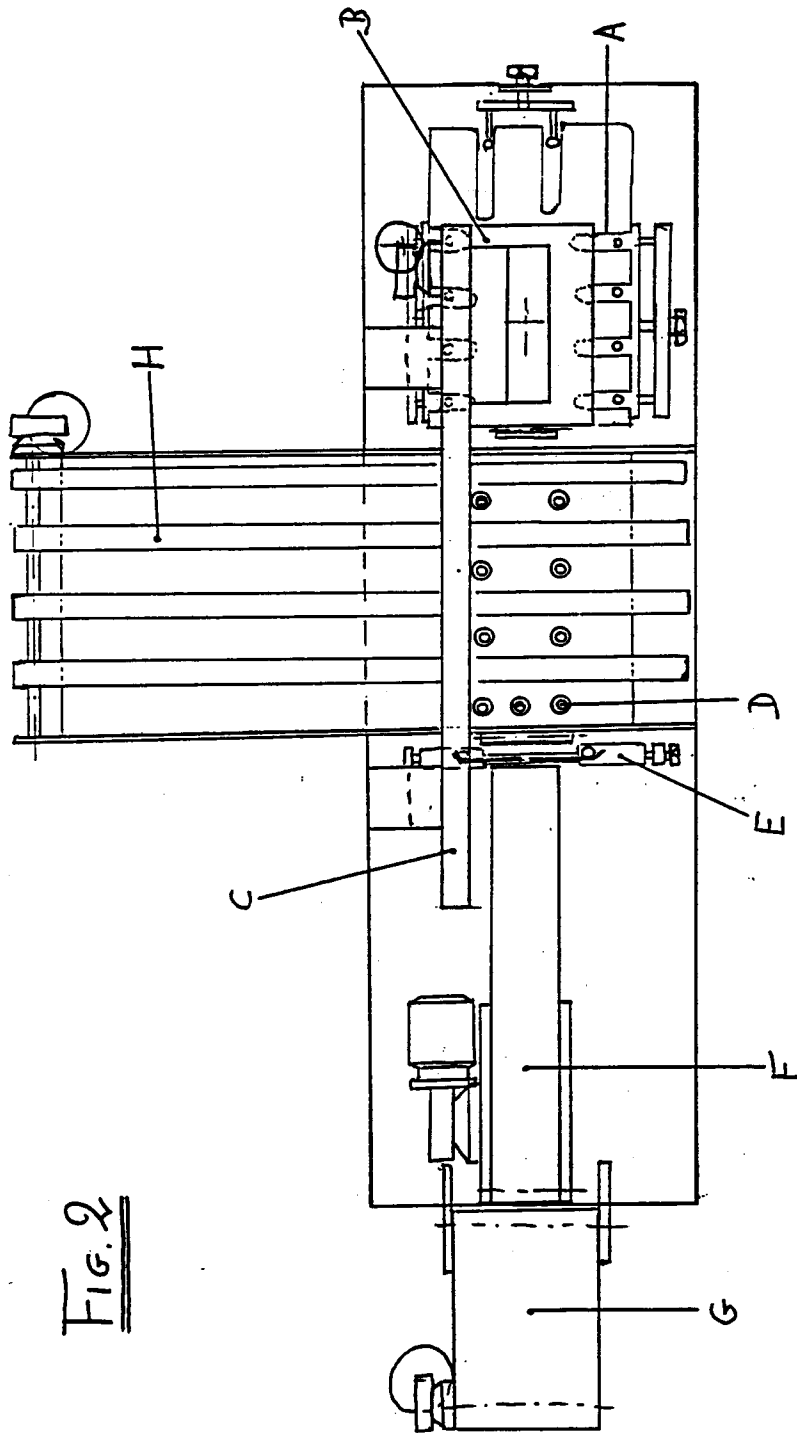


FIG. 2



EUROPEAN SEARCH
REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X,A	US-A-4 864 800 (BANYS , A.R.) * the whole document * - - - -	1,4	B 65 B 43/14 B 65 B 43/26 B 65 B 39/12
A	US-A-3 501 893 (PETERSON , A.F.) * the whole document * - - - -	1,4	
A	US-A-4 345 629 (INGLETT JR. , W.L.) * the whole document * - - - - -	1,4	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 B
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		17 September 91	NGO SI XUYEN G.
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