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APPARATUS FOR PACKING AMPULES INTO CARTONS OR LIKE CONTAINERS

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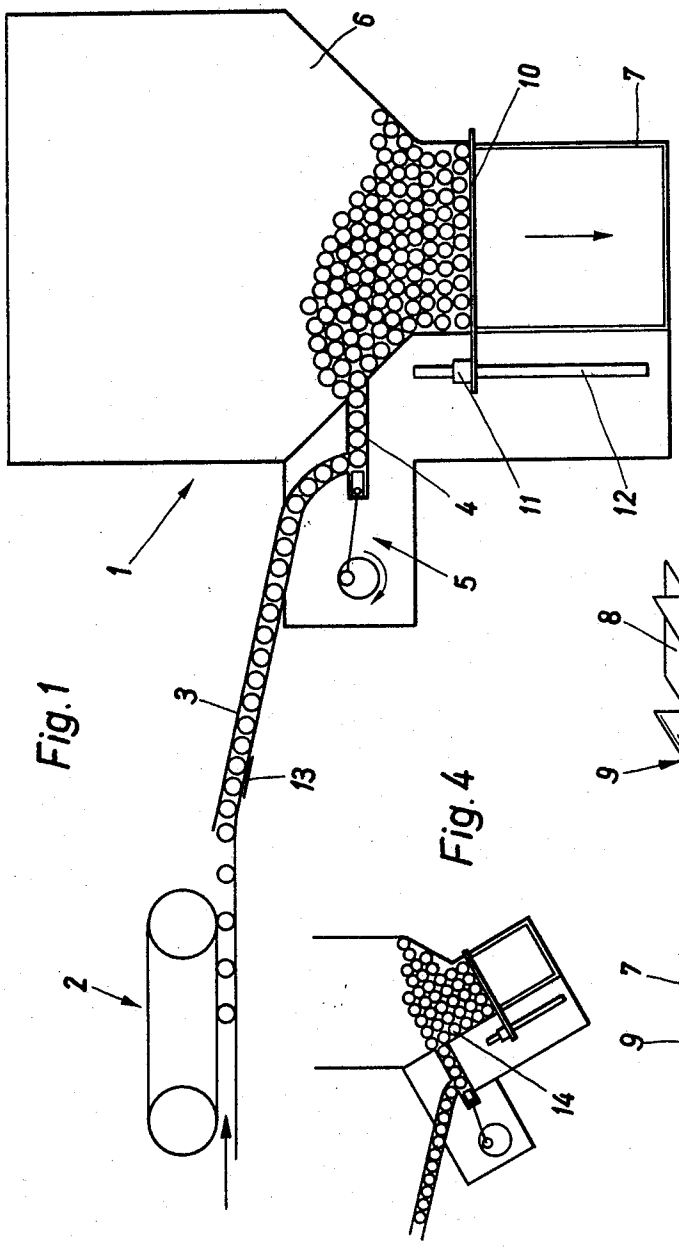


Fig. 1

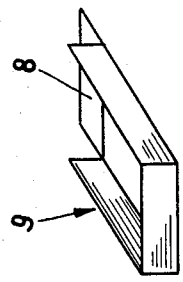


Fig. 3

Fig. 4

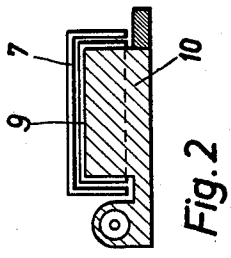


Fig. 2

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APPARATUS FOR PACKING AMPULES INTO CARTONS OR LIKE CONTAINERS

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ABSTRACT OF THE DISCLOSURE

An apparatus for packing ampoules into cartons has a hopper which serves as collection means for the ampoules from an outlet of a printing or labeling machine. The ampoules are pushed by a feed member through a feed passage into the hopper. A plate is adapted to close the outlet of the hopper and to be lowered in and inserted into a carton mounting means and rotated about a spindle carrying the plate.

This invention concerns apparatus for packing ampoules or like articles into cartons or similar containers and is particularly concerned with the arrangement of the carton receiving means and of the construction of the ampoule feed means to the carton or carton receiving means in such apparatus.

For packing ampoules which are in random positions machines are known into which the ampoules can be fed in the random condition and from which they emerge again in an orderly arrangement and in parallel positions, whereupon the ampoules are fed in their orderly position to the actual packing machine so as to be inserted either into corrugated packing inserts or trays when packed in small numbers or into cartons for bulk packing.

It is known to combine such machines for repositioning the ampoules with apparatus into which an open box with a hingedly connected front side is inserted, whereupon the ampoules which are fed in an orderly condition, first move onto a slide which, corresponding to the speed of feeding the ampoules slides slowly downwardly into the box so that the latter is filled slowly from top to bottom. The feed of the ampoules is carried out at a certain pressure, which also serves to lower the slide. After the box is filled, the feed of the ampoules is stopped, the box is removed after previously swinging the slide out, a new box is inserted and the slide is again swung into the upper region of the new box. The filling process can then be repeated. Since this filling apparatus can only be operated at a certain working pressure, it can, in practice only be used in combination with the above-mentioned ampoule repositioning machine.

If it is intended, for example, to pack ampoules coming from a labelling or printing machine, from which the ampoules emerge in a correctly oriented state, it becomes necessary if the whole packing process is to be effected mechanically—first to insert these correctly oriented ampoules again into the repositioning machine, which is in fact superfluous, in order to be able to feed them from that machine into the actual packing machine. Generally such a method of working is not chosen with ampoules which are in correctly oriented state but such ampoules as they emerge from a labelling or printing machine are allowed to drop into a container and the packing into cartons is then effected by hand.

A connection of the carton filling device for example directly with the outlet of a labelling or printing machine and which, avoids the above-mentioned repositioning machine is not possible because those machines work continuously whilst carton filling machines of the known type only work intermittently so that with a direct connection of such filling device, the labelling and printing machine would also have to work intermittently.

It is therefore an object of this invention to avoid the above disadvantages and provide an apparatus for packing ampoules into cartons or like containers, by means of which continuously supplied ampoules which have been oriented as required in a preceding operation can be packed into cartons or like containers.

According to the present invention, there is provided apparatus for packing ampoules into cartons or like containers open on two sides comprising means serving to receive a carton or like container, a funnel like hopper above said means and open on one side the outlet of which hopper opens into said means, an ampoule feed passage adapted to receive ampoules for packing which passage is operatively associated with an ampoule feed member and opens into said hopper, and a drivable spindle beside said carton receiving means which carries a plate which is insertable into and removable from, said receiving means and is arranged to be lowered by said spindle to feed ampoules collected thereon into a container.

By arranging a funnel or hopper in front of the carton receiving member or in front of an inserted carton I provide for the ampoules conveyed in parallel positions to be collected still in parallel position in this funnel above the said plate which acts as a baffle and which is initially located in the upper part of the carton receiving means. It is thus ensured that the ampoules fed continuously by an ampoule feed member such as a ram or piston into the funnel and arriving continuously from the preceding machine, can be received in the funnel continuously. The packing process proper only starts when the funnel or hopper contains a certain number of ampoules. If desired this priming can be effected by hand upon starting the machine. This preliminary filling or priming is only necessary once, when operations are started.

Corresponding to the feed speed, the baffle and lowering plate is positively guided downwardly into the carton so that the ampoules in the funnel also move down and fill the carton i.e. the filling process takes place independently of any feed member and only under the action of the weight of the ampoules upon the baffle and lowering plate. Upon reaching the lowermost position, the spindle drive is disconnected automatically, the lowering plate is swung out of the carton, moved upwardly again and inserted from the front into the ampoules which have accumulated as a result of the continuous feed, the filled carton can then be removed, the ampoules located in the funnel or hopper being retained by the baffle and lowering plate. After inserting a new carton, the process takes place again in the manner described.

Continuously conveyed and oriented ampoules can thus be received and packed advantageously by this apparatus without requiring an intermediate machine of the said type for this purpose.

The control of such an apparatus can be effected in a simple manner by limit switches, i.e. the spindle drive can be actuated by limit switches in such a manner that upon reaching the lowermost position of the plate it is disconnected and connected again when the plate is swung in. It is also possible to provide a feeler plate in the vicinity of the feed passage, by means of which the ampoule feed member and the spindle drive are disconnected should the feed of ampoules stop, and are connected again when the feed of ampoules is resumed. It is thus ensured that the supply of ampoules in the funnel can not be used up when the feed of ampoules no longer takes place.

Preferred apparatus according to the invention will now be described by way of example with reference to the accompanying drawings in which:

FIG. 1 is a diagrammatic view of apparatus according to the invention;

FIG. 2 is a view of the engagement of the baffle and lowering plate in the carton to be filled or the carton receiving means;

FIG. 3 is a perspective view, of the bottom part of a carton to be filled, as it will be inserted into the carton receiving means, and

FIG. 4 is a further embodiment of the apparatus according to the invention.

The apparatus **1** according to the invention is connected by an ampoule feed passage to the outlet of e.g. a printing or labelling machine **2** from which the printed or labelled ampoules emerge oriented so as to be parallel to each other and enter a guide passage **3** which opens into an inlet passage **4** through which the ampoules are pushed into a funnel or hopper **6** by means of an ampoule feed member, such as a piston with a crank drive. On the under side of this funnel or hopper **6** there is connected a carton receiving member **7** into which a cardboard box **9**, open on two sides, see FIG. 3, is inserted, the open front wall **8** of which is pushed up behind the baffle and lowering plate **10** as shown in FIG. 1. This baffle and lowering plate **10** is provided with a spindle **12**. The drive means for the spindle **12** is so arranged that the baffle and lowering plate **10** can not swing out of the cardboard box inadvertently. A detailed illustration of the construction and design of the drive is omitted since many known devices are available for this purpose. The whole apparatus is arranged at a slight inclination to the vertical in order to prevent the ampoules from falling out of the funnel and carton assembly which is open on the front side.

In the guide passage **3** which, having regard to the inclination of the device, has a slightly twisted shape, a feeler plate **13** can be mounted which is connected with a switch device for connecting and disconnecting the spindle drive. As mentioned above, further limit switches can be provided at suitable positions in the device, such switches being omitted since here also known switch devices may be used.

It has been found advantageous to connect the carton receiving means so that it forms an extension of an inclined wall **4** of the funnel as shown in FIG. 4 having regard to the position of the ampoules in the funnel which results. Due to the inclination of the funnel or hopper wall on the ampoule feed side, the ampoules do not dispose themselves between two adjacent lower ampoules so that a miximum spacing between the ampoule heads results. This is indeed initially also the case in the embodiment according to FIG. 1 but due to the carton receiving member being vertically below the funnel outlet that arrangement of the ampoules is varied, i.e. an arrangement of the ampoules takes place where they fill the spaces between two lower ampoules. Thus the spacing of the ampoule heads becomes smaller and the insertion of the baffle and lowering plate **10** can be made more difficult whereas the insertion of the baffle and lowering plate **10** in the embodiment according to FIG. 4 can be carried out without difficulty. The difficulty of insertion in the embodiment according to FIG. 1 can also be countered for example, by making the baffle and lowering plate **10** resilient up to a certain degree or by inserting this plate into the ampoules not from the front but from the side of the receiving member **7** which can be provided with a slot to receive said plate.

What I claim is:

1. Apparatus for packing ampoules into cartons open on two sides comprising means for mounting a carton in position with the upper end and one lateral side open, a funnel-like hopper above said means having a lower outlet communicating with said means and with the open lateral side of said carton, an ampoule feed passage adapted to receive ampoules for packing which passage is operatively associated with an ampoule feed member and opens into said hopper, a drivable spindle beside said carton mounting means and a plate carried by said spindle which is insertable into and removable from said mounting means and operates by said insertion to contact directly said ampoules both above and below said plate and thereby separate ampoules charged to said carton from ampoules remaining in said hopper above said plate, said plate being adapted to be lowered by said spindle to feed ampoules collected thereon into said carton.

2. Apparatus as claimed in claim **1** in which said carton mounting means is connected to the outlet of the hopper as an extension of one of the inclined walls of the hopper.

3. Apparatus as claimed in claim **2** in which said feed passage extends at right angles into said inclined wall of the hopper.

4. Apparatus as claimed in claim **1** in which said plate is made of resilient material.

5. A method for packing ampoules into cartons which comprises mounting a carton with its upper end and one lateral side open below a superjacent hopper, feeding ampoules through an ampoule feed passage adapted to receive ampoules for packing, which passage is operatively associated with an ampoule feed member anl opens into said hopper, collecting said ampoules in said hopper, feeding ampoules from said hopper by gravity into and through said open lateral side of said carton, said ampoules during said feeding process being supported by a plate which is lowered through the lateral open side of said carton, removing said plate from said carton and reinserting it at the top of said carton in direct contact with said ampoules both above and below said plate thereby to separate ampoules in said carton from ampoules remaining in said hopper, thereafter removing the carton loaded with ampoules from below said plate and replacing it with a similar empty carton, and thereafter lowering said plate whereby ampoules located above and supported by said plate are fed into said carton from said superjacent hopper.

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