

A method and an equipment for installing a medicine capsule on a support¹

5 The present invention relates to a method and an equipment for installing a tubular medicinal capsule on a support. The medicinal capsule concerned may be e.g. a capsule releasing a contraceptive substance, and which is installed on a suitable support for fixing the capsule inside the womb. Such contraceptive means are known per
10 se and manufactured in different ways. In these, the support is formed from an anchor-like element of an inert substance, on whose arm the hollow tubular medicinal capsule is installed.

15 It is known to install such a tubular medicinal capsule on the support by swelling of the capsule in a suitable solvent and thereafter inserting the capsule in its swollen state on the support. The capsule shrinks as the solvent evaporates, and consequently becomes fastened on the
20 support.

In the equipment according to the invention, a different principle is followed. This principle is based on the expansion of the capsule by an internal pressure to such
25 a state that the support may be inserted inside it. When the pressure has been relieved, the capsule then returns towards its initial state and becomes fastened on the support. The characteristic features of the method and equipment according to the invention appear from the enclosed claims.
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The invention is described by means of the accompanying drawing, in which

35 Fig. 1 shows an inventive equipment in the initial step of the installation of a medicinal capsule;

Fig. 2 shows the next step of the operating cycle of the



installation;

Fig. 3 shows the equipment in an installation step, where the medicinal capsule is in a closed connecting mould;

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Fig. 4 shows the equipment in an installation step, where the support is in the initial state of the installation step;

10 Fig. 5 shows the equipment in the final step of the installation;

Fig. 6 shows the equipment after the installation has been completed;

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Fig. 7 shows the equipment in the removal step of the ready product.

20 Fig. 1 shows the basic parts of the inventive equipment in the initial step of the installation cycle. A connecting mould or housing 4 is in its open position and a pressure needle 7 is inserted in an opening 5 of the mould prepared to receive a capsule 1, which is brought to the connecting mould on a mandrel 6, when the mould is open. When the capsule supported by the mandrel and the pressure needle meet at the mouth of the opening of the mould, the pressure needle starts a withdrawal movement. After this, the mandrel 6 and the capsule 1 thereon as well as the pressure needle located against the end of the capsule continue their movement in a direction, where
25 30 the capsule advances into the open mould.

When the capsule has totally entered into the connecting mould, the situation is as shown in Fig. 3, i. e. the
35 mould is closed and the mandrel 6 has started its return movement. At the same time, the pressurized needle 7 follows the mandrel inside the capsule, and expands then the

capsule by means of air discharging from the openings at the needle tip, and thereby helps the removal of the mandrel. After the mandrel has left the capsule and the pressure needle has reached the end of the capsule, a support 3 on which the capsule is to be installed is brought to the end of the capsule, from which the mandrel has been removed, as shown in Fig. 4.

After this, the support 3 is pushed inside the capsule to follow the pressurized needle 7 expanding the capsule when escaping ahead the support, as shown in Fig. 5 and 6. When the support has been pushed to an accurate position in the capsule, the connecting mould is opened and the ready product is removed. The pressure needle is pushed to the opened mould, and the operating cycle is started from the beginning according to Fig. 1.

The equipment described also includes two guides 8, 9 on both sides of the connecting mould 4, which help the operation by guiding on one hand the movements of the mandrel 6 and on the other hand the movements of the pressure needle 7. However, these guides are not essential, if the movements of said parts and the tightness of the operation can be ensured by other means.

The cross-sectional form of the opening 5 of the connecting mould 4 is preferably selected compatible with the cross-sectional form of the support 3.

For controlling the correct mutual operation of the equipment parts, the equipment naturally includes an electric control system, whose detailed construction and operation are well known to those skilled in the art, and they do not form an essential part of the present invention.

Claims

1. A method for installing a tubular medicinal capsule, preferably a coated medicinal capsule, such as a contraceptive capsule on a support, characterized in that the opening extending through the capsule is expanded by pressurizing the opening immediately ahead the support being inserted into the opening, and thereafter fastening the capsule on the support by relieving the expanding pressure.
2. An equipment for installing a medicinal capsule (1) provided with a through-opening on a rod-like support (3), such as for installing a contraceptive capsule on an arm of an anchor-like suspender, according to claim 1, characterized in that the equipment comprises:
- a connecting mould (4), which is provided with a through-opening (5) and being dividable into two or more parts (4', 4'') relative to at least one plane through the opening, the length of the opening exceeding the length of the capsule (1) to be installed;
 - a mandrel (6) to be inserted into the opening (5) of the connecting mould and withdrawable therefrom at one end of the opening, the outer diameter of which mandrel essentially corresponds to the inner diameter of the tubular capsule to be installed, and the length of which essentially corresponds to the length of the capsule to be installed;
 - a pressure needle (7) insertable into and withdrawable from the opening (5) of the connecting mould at the end opposite to the mandrel (6) inlet end, the tip of the pressure needle being open and the outer diameter of it essentially corresponding to the inner diameter of the hollow capsule to be installed;



- means for inserting the support (3) into the connecting mould opening (5) from the same end as the mandrel (6), as well as for withdrawing the support therefrom;

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- controll means for controlling the mutual operation of the parts (4', 4'') of the connecting mould (4), the mandrel (6), the pressure needle (7) and the insertion devices of the support (3); and

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- pressure means for pressurizing the pressure needle (7).

