

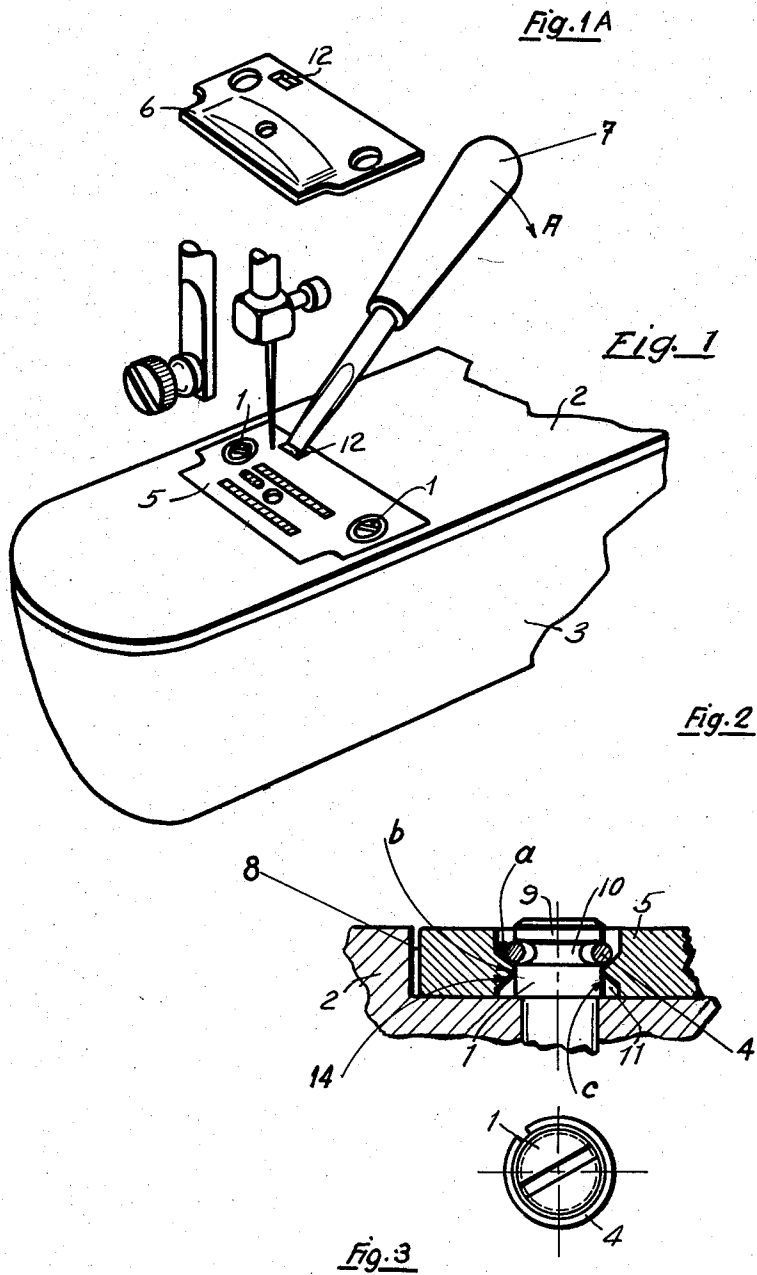
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R. CASAS ROBERT

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SEWING MACHINE THROAT PLATE RETAINING MEANS

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Inventor,
Ramon Casas-Robert
By *Young, Eney & Thompson*
Attys.

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SEWING MACHINE THROAT PLATE
RETAINING MEANSRamon Casas-Robert, Geneva, Switzerland, as-
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In usual sewing machines, the throat plate is generally held in position by two slotted screws located on opposite sides of the hole adapted for the passage of the needle. But these screws are not easily manipulatable as their spacing is less than the width of the needle-supporting head. It thus follows that a screw driver cannot be held in line with their axes so that the slots of the screws become damaged. Further if the screw driver slips, a burr is produced on the edge of the slot of the screw; which is liable subsequently to ruin the fabric which is being operated upon.

It would be of great advantage to the user to be able to easily remove the throat plate either for cleaning the parts of the sewing machine located under the plate of the machine, or for replacing the throat plate used for sewing by a throat plate provided with a tooth guard to be used for darning work.

Some manufacturers have provided their machine with a throat plate made integral with the shuttle cover plate, the securing of this plate being effected by a spring secured in its central portion to the lower face of said plate and whose two ends are adapted to cooperate with the edges of a closing cover plate fixed rigidly to the framework of the machine. In sewing machines equipped with such a throat plate the latter must be withdrawn, by causing it to slide in its seat, in order to cause the ends of the spring to escape the edges of the cover plate. However the throat plate can only be removed after it has been caused to rock in order to become disengaged from the teeth provided to produce the feed of the fabric. In fact, in order to do this, it is necessary to lift the sewing machine from its support and act on the under face of said throat plate.

An object of the present invention is to provide an improved device for holding a removable throat plate member on a seat about an opening in a frame member of the sewing machine including a plug carried by one of said members, the other of said members having a circular socket opening for receiving said plug and cooperating spring and cam means carried by the plug and socket opening to releasably retain the plug in the socket and said throat plate member on the seat of the frame member.

Another object of the invention is to provide a device of this class, wherein the stationary part of the machine has a recessed seating for the throat plate.

Another object of the invention is to provide a device of this class, wherein the stationary member consists of a plug in the form of a screw with

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cylindrical head provided with a circular groove, the throat plate having a through pocket opening provided with a conical seat and a conical guiding surface, and a spring in the shape of a split ring, located in the circular groove of the pin, becoming engaged together with the pin in the through socket opening when a pressure is exerted on the throat plate and wherein the conical guiding surface causes the centering of the screw head in the through socket opening and a compression of the spring when a pressure is exerted on the throat plate, a further pressure exerted on the throat plate permitting the split ring to expand and become applied to the conical seat in the through opening of the plate, the spring exerting thus the forces necessary to hold the throat plate.

A further object of the invention is to provide a throat plate equipped with a device of this class and provided with means for allowing a force to be exerted on this plate for disengaging and removing same.

Still another object of the present invention is to provide a removable throat plate to be held on a cover plate fastened to the frame of the machine equipped with two devices of the above class consisting chiefly in two stationary spaced screws with cylindrical head serving as plugs, two spaced through holes or socket openings in the throat plate to receive the two screw heads, a recessed seating in the cover plate of the machine and two split-ring springs, this throat plate being further provided with an opening adapted to receive a tool by means of which a force may be exerted on the throat plate for disengaging and removing same.

One form of the device of the present invention is shown diagrammatically and by way of example in the accompanying drawing. Only the parts of a sewing machine necessary for a clear understanding of the holding device have been shown.

Fig. 1 is a perspective view of the assembly.

Fig. 1a is a perspective view of a modified form of throat plate.

Fig. 2 is a partial view in section of the device.

Fig. 3 is a plan view of a part of the device.

In the drawing 3 indicates the framework of the machine a portion of which only is shown. In the interior of this framework are mounted the shuttle, the teeth carrying member producing the fabric feed and the actuating members therefor. A cover plate 2 is secured in a stationary manner by two members 1 having a cylindrical head

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such as shouldered pins or screws with cylindrical head as shown.

The cover plate 2 is provided with a seat 8 adapted to receive a throat plate. The latter may be formed by a plate 5, Fig. 1, for sewing or by a plate 6, Fig. 1A, provided with a teeth guard for darning work. These plates 5, 6 are selectively held and maintained in position in the seat 8 by means of two spring latches the parts of which are brought into engagement, that is to say into the locked position (position shown), or disengaged from one another by a simple pressure of a pull respectively exerted on the throat plate.

In the case shown, one of the parts of each of the latches is mounted on the free end of two securing screws 1. For this purpose, these screws have a cylindrical head 9 and a circular groove 10 with which engages a split ring spring 4. Another part of this latch is formed by a conical seat *a* which projects into the interior of a circular through hole or socket opening 11 provided in the plates 5 and 6. The position of this seat relatively to the inner face of the throat plate is such that when this is in position in its recessed seat (Fig. 2), the spring 4 cooperates with the conical surface *a* in such a manner as to exert two opposed forces, one on the screw, the other on the throat plate, urging the latter into position and maintaining its lower resting face in contact with the bottom surface of the seat 8, the latter acting as a rest for this plate.

It will be clear that a simple pull exerted on the throat plate produces the disengagement of the members *a* and 4 of the latch, the depth of the groove 10 being so provided that the spring 4 can—when it is in the compressed condition—pass through the most reduced section of the through hole 11. A force exerted on said throat plate will cause it to rock around one of its edges and produce as well the disengagement of the latch.

In order to reduce as far as possible the lateral clearances between the throat plate and its seat, without, however, necessitating great precision for the control of the plate and its seat, the smallest diameter of the through hole or socket 11 is only slightly greater than that of the head 9 of the screw 1. Thus the cylindrical portions *b* of the two holes 11 cooperating with the cylindrical portions *c* of the heads 9 of the screws prevent movements of translation of the plate within its seat 8.

In the case shown the throat plate is enclosed completely in its seat so that it is necessary to provide a device enabling a pull to be exerted thereon for disengaging and removing it.

This device is formed by an opening 12 with at least one straight or slightly under cut edge; enabling the tip of a screwdriver 7 or other tool to be introduced. By examination of the accompanying drawing it will be understood at once that by exerting a crosswise push in the direction of the arrow A on the handle of the screwdriver 7, the tip of which is engaged in the opening 12, the plate is caused to rock around its right hand edge, this producing the disengagement of the latches.

Finally in order to enable the plate 5 or 6 respectively to be placed in position easily and rapidly, each through hole 11 is provided with a conical portion 14. This conical portion guides the end of the head of the screw 1 in the through hole 11 and causes a radial compression of the spring 4 under the action of a light push exerted

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on the plate for the purpose of setting it in place.

The device described has numerous advantages as compared with known holding devices. In the first instance it allows of a rapid and easy replacement of a sewing throat plate 5 by a darning throat plate.

Further as no small parts such as screws or other tightening members need be removed, no risk of loss of any of such members is to be feared. Further, burrs are not liable to be produced as a result of the slipping of the screw driver out of the slot of a screw head so that no risk of damage to the fabric being worked upon is to be feared from such burrs.

Finally when the user desires to go over from sewing to a darning operation, he must withdraw the throat plate. Then, when this plate is withdrawn, the members located in the interior of the framework 3 are visible. At each change of the throat plate, the user is thus almost compelled to see the state of cleanliness of these members and he can proceed with their cleaning if necessary.

This is a very important point as, for obtaining a satisfactory operation and a long service from a sewing machine, it is necessary for these mechanical members to be kept clean.

A form of construction of the securing device, of the present invention, has been described here by way of example with reference to the accompanying diagrammatic drawing, but it will be understood that all the members and devices described may be replaced by their mechanical equivalents without departing from the scope and spirit of the invention.

It is also possible to provide only one latch for maintaining the plate in position in its seating but it is also possible to provide more than two latches.

The opening shown for exerting a moment on the plate for producing its disengagement may naturally be replaced by any other equivalent means.

I claim:

1. In a sewing machine having a needle and a frame provided with an opening in its upper surface, said surface having a seat about said opening to receive a throat plate, a throat plate having a circular through opening therein, an annular projection of triangular cross section intermediate the ends of the through opening to provide a restricted portion, a screw threaded into the frame and provided with a cylindrical head having an annular recess in the circumferential surface thereof, and a split resilient ring loosely mounted in said annular recess and cooperating with the projection in said through opening to detachably retain and urge the plate on its seat.

2. In a sewing machine having a needle and a frame provided with an opening in its upper surface, said surface having a seat about said opening to receive a throat plate, a throat plate having a circular through opening therein, an annular projection of triangular cross section intermediate the ends of the through opening to provide a restricted portion, a screw threaded into the frame and provided with a cylindrical head having an annular recess in the circumferential surface thereof, and a split resilient ring loosely mounted in said annular recess and cooperating with the projection in said through opening to detachably retain and urge the plate on its seat, said annular projection in the through opening and cylindrical screw head being of substantially

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the same diameter to definitely locate the plate relatively to the frame.

3. In a sewing machine having a needle and a frame provided with an opening in its upper surface, said surface having a seat about said opening to receive a throat plate, a throat plate having a needle opening and a pair of circular through openings therein disposed on opposite sides of the needle opening, an annular projection of triangular cross section intermediate the ends of each through opening to provide a restricted portion, a screw for each through opening threaded into the frame and provided with a cylindrical head having an annular recess in the circumferential surface thereof, and a split resilient ring loosely mounted in each annular recess and cooperating with the projection in said through opening to detachably retain and urge the plate on its seat, said annular projections in the through openings and cylindrical screw heads being of substantially the same diameter to definitely locate the plate relatively to the frame, said plate having a tool receiving opening for rocking the plate to release the same.

4. In a sewing machine having a needle and a hollow work support beneath the needle, a cover plate member for the hollow work support and provided with an access opening in its upper surface, said upper surface of said cover plate member having a seat about said opening to receive a throat plate member, a throat plate member mounted on said seat, means for securing the throat plate member on its seat including a plug carried by one of said members, the other of said members having a socket opening defined by a cylindrical wall for receiving said plug and having upper and lower extremities, said socket opening wall having projection means, at a region intermediate the upper and lower extremities of said socket opening, of substantially triangular shape in cross section, said plug having a protruding part of cylindrical shape provided with an annular recess in the circumferential surface thereof, and a split resilient ring loosely mount-

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ed in said annular recess and cooperating with said projection means acting as camming surfaces for engaging and contracting the split resilient ring upon placement and removal of the throat plate.

5. In a sewing machine having a needle and a frame member provided with an opening in its upper surface, said surface having a seat about said opening to receive a throat plate member, a throat plate member mounted on said seat, means for retaining said throat plate member on said seat including a plug carried by one of said members, the other of said members having a socket opening defined by a cylindrical wall for receiving said plug and having upper and lower extremities, said socket opening wall having projection means, at a region intermediate the upper and lower extremities of said socket opening, of substantially triangular shape in cross section, said plug having a protruding part of cylindrical shape provided with an annular recess in the circumferential surface thereof, and a split resilient ring loosely mounted in said annular recess and cooperating with said projection means acting as camming surfaces for engaging and contracting the split resilient ring upon placement and removal of the throat plate, the cylindrical part of the plug having an external diameter substantially the same as the internal diameter of the projecting means in the socket to definitely locate the throat plate relatively to the seat.

RAMON CASAS-ROBERT.

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