July 2, 1929. F. W. VICKERY 1,719,094

MECHANISM FOR INSERTING DOCTOR BLADES

Filed Dec. 24, 1927

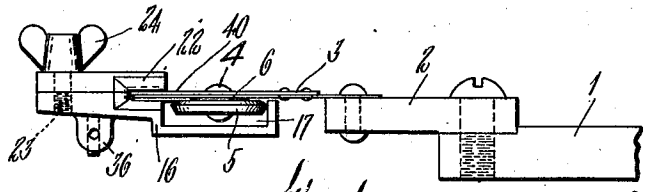


Fig. 1.

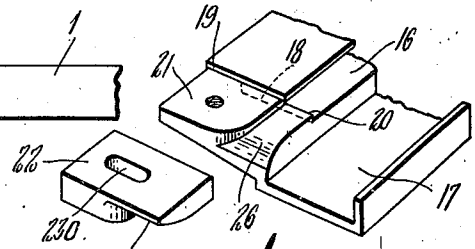


Fig. 3.

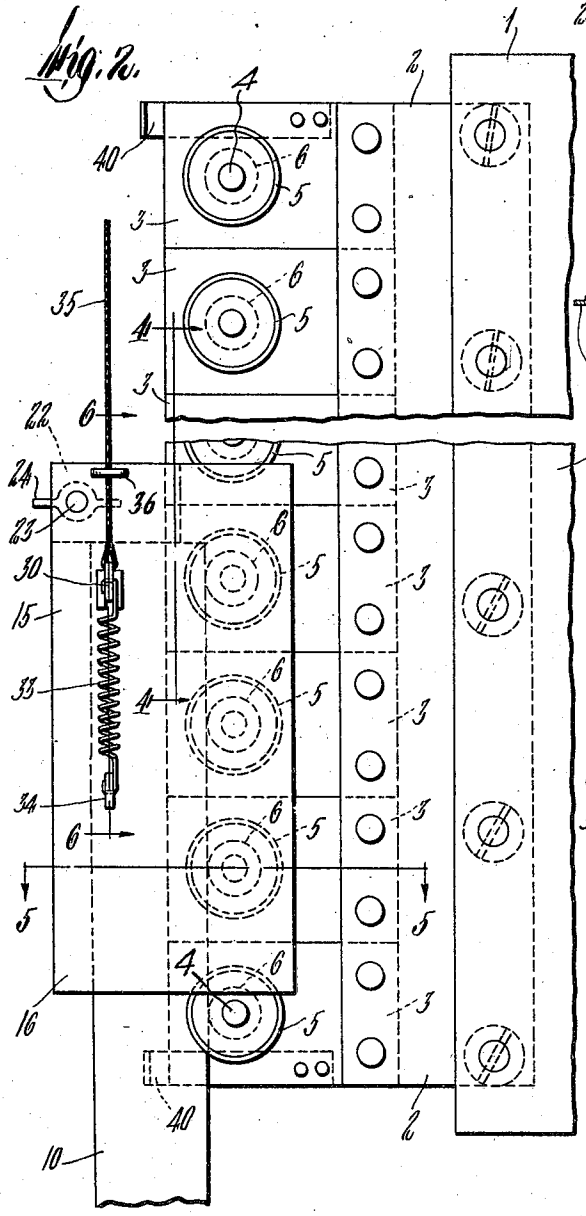


Fig. 2.

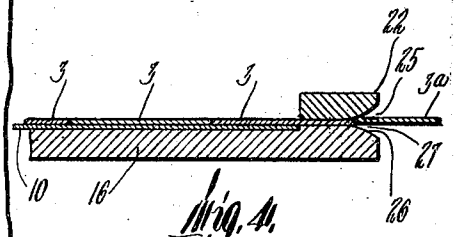


Fig. 4.

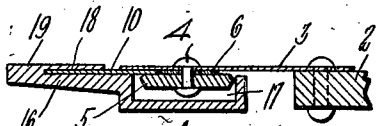


Fig. 5.

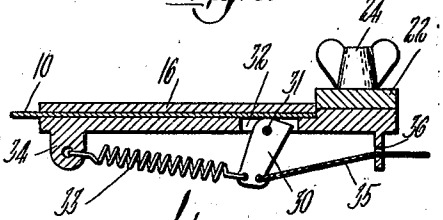


Fig. 6.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR INSERTING DOCTOR BLADES.

Application filed December 24, 1927. Serial No. 242,493.

In my Patent No. 1,552,363, granted September 1, 1925, for doctor for calender and like smooth rolls, is disclosed a doctor comprising a flexible blade held to the periphery of the roll by means of a plurality of spring fingers, one end of each of which carries the blade and the other end is carried by a rigid support. The blade is usually supported by the spring fingers in a groove or pocket formed between one face and a retaining member or "keep" carried by that finger and spaced sufficiently from that face. These spring fingers may be independent of each other so that the grooves or pockets may not always be in exact alinement when the doctor blade is removed. Consequently when inserting a new blade it is sometimes necessary to move the fingers so that their grooves or pockets shall be in alinement before the blade can be advanced from the groove or pocket of one finger into the groove or pocket of the next in succession. In the case of certain machines in which doctors are employed, it is necessary to insert the blades through a hole in the side frame of the machine and in such machines it is not possible to obtain access to the spring fingers to bring them into alinement while the blade is being inserted.

The object of the present invention is to produce a mechanism by which the blade can be inserted endwise and by which the spring fingers are automatically adjusted into alinement if they chance to be out of alinement so that the grooves or pockets therein are properly positioned successively to receive the blade as it is presented thereto. For this purpose the device comprises a holder or carrier in which one end portion of the blade may be clamped, with means by which this member may be guided along the spring fingers in succession in such a manner that the spring fingers are successively moved to bring their grooves or pockets into alinement in case they chance to be out of such alinement. This member may be drawn through the machine, carrying the end of the blade therewith, which is thereupon threaded through the grooves or pockets in the spring fingers as the member is drawn through.

In some cases the blade support may comprise a single spring plate instead of a plurality of fingers. With such construction the alining feature of the carrier is not used, but it does act to correctly position the blade, being guided by its engagement with some suitable parts such as the plate and the keeps positioned therealong to perform this function.

For a more complete understanding of this invention, reference may be had to the accompanying drawings in which

Figure 1 is an end elevation of a doctor showing the device of the present invention in position thereon, carrying a blade.

Figure 2 is a bottom plan showing the spring fingers and the carrier with the blade fixed therein partially drawn across the row of spring fingers carrying the blade therewith.

Figure 3 is a perspective showing certain details of the carrying member.

Figures 4, 5 and 6 are detail sections on lines 4—4, 5—5 and 6—6, respectively, of Figure 2.

Referring first to Figures 1 and 2, 1 indicates a portion of the support upon which the doctor proper is mounted. To this support is shown attached a base bar 2 which carries a series of spring fingers 3. As shown these are arranged in close array along the length of the bar 2, but they might, if desired, be spaced therealong in the manner shown in my patent hereinbefore noted or a single spring plate might be used.

Each of these spring fingers 3 has fixed thereto at its outer end, as by means of a rivet 4, a retaining member or "keep" 5. This keep may be of any suitable type, but is herein shown in the form of a disk spaced from the adjacent face of its spring finger by any suitable means such as a spacing washer 6, the space being sufficient to permit the positioning therein of the rear edge of the doctor blade 10. The blade may be retained in position in this groove or pocket between the keeps and the spring fingers by any suitable means.

As these spring fingers are independently supported, it is evident that their outer ends where the keeps are fixed thereto may not always be found in alinement when it is desired to insert a blade, and consequently it will be difficult, if not impossible, to thread the rear edge of a blade therethrough by endwise movement. In order that this may be accomplished, however, I provide a carrier indicated in general at 15. This carrier comprises a main frame member 16 engageable with the fingers and having a channel portion 17 along

its rear edge so formed as to engage over and be guided by the keeps 5 as the carrier is drawn along the spring fingers.

Along the opposite edge of the frame member it is provided with a slot 18 closed at its outer edge as at 19 and of such width that the end of the blade 10 may be inserted therein as shown, for example, in Figure 5. This slot extends from the rear end of the carrier along one side of the channel 17 to a shoulder portion 20 near the forward end of the carrier forwardly of which is a portion 21 of reduced thickness, this portion 21 forming a seat to receive a block 22. The shoulder 20 serves as an abutment to limit the extent to which the end of the blade 10 may be pushed toward that end of the carrier. The block 22 may be fixed in its position on the frame by any suitable means such as the bolt 23 extending through a slot 230 in the block 22 and provided with a wing nut 24 on its outer end. The under face of the block 22 is cut away at 25 opposite to a similar cut away portion 26 on the frame member 16, these two cut away portions defining a slot 27 having a relatively wide outer end and tapering rearwardly lengthwise of the carrier. This slot is so positioned, as shown best in Figure 4, as to receive the outer ends of the spring fingers 3 therein between the member 16 and the block 22 as the carrier is successively drawn along the length of the doctor, the end opening of the slot being sufficiently wide to receive therein spring fingers which may be out of alinement with those previously engaged by the carrier, as shown by the spring fingers 3 and 3^a in Figure 4, and gradually move them into alinement as the narrower portion of the slot 27 passes into engagement therewith. Thus as the carrier is drawn along by means which will later be described, the spring fingers are successively engaged and if they are not in alinement with each other they are moved into alinement in position to receive the end of the blade, which, it will be noted, is positioned just behind the block 22.

The blade 10 may be fixed to the carrier to be drawn therewith in any suitable manner, but as herein shown it is clamped in position within the slot 18 by means of a cam 30 best shown in Figure 6. This cam is pivoted as at 31 within a slot 32 in the frame member 16 and is normally urged out of clamping position by means of a spring 33 reacting between its outer end and a lug 34 on the frame. It may be brought into clamping engagement with the blade 10, however, by means such as a cord or wire 35 threaded through an eye 36 on the frame and engaging the outer end of the cam. This cord or wire 35 is passed through the machine from one side to the other along the line of the spring fingers and its end is threaded through the eye 36 and fixed to the cam 30. The blade 10 being in position, and the forward end of the carrier engaged in guided relation with the adjacent fingers, the cord or wire is then pulled back and the cam rocked in opposition to the spring 33 to clamp the blade to the carrier, continued pulling drawing the carrier with the blade through the machine, successively engaging and insuring alinement of the spring fingers 3 from one side to the other and threading the rear edge of the blade 10 into the grooves or pockets between each spring finger and its keep. When the forward edge of the carrier reaches the retaining finger 40 the block 22 is slid outwardly to an extent sufficient to disengage it therefrom or the block is removed whereupon the carrier may be pulled entirely through the machine and the blade 10 disengaged therefrom and its end held by the retaining finger 40. The blade is thus inserted in the proper position and the carrier removed from the machine.

Where a single spring plate for holding the blade is employed, the carrier is drawn therealong, being held thereto by engagement of the member 16 and the block 22 on opposite sides, and guided thereby and by the keeps which are spaced therealong and ride in the channel 17. The flaring of the slot 27 facilities the placing of the device in position preparatory to drawing it through the machine even though its centering action is not needed, as it may be when a plurality of blade holding fingers are used.

Having thus described an embodiment of this invention, it should be evident to those skilled in the art that various changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. A device for positioning doctor blades relative to a series of blade-retaining elements, which comprises a carrier for said blade, means on said carrier for engaging said elements to be guided thereby in position to present said blades successively into cooperative relation to said elements as said carrier is drawn along said series of elements, and means for so drawing said carrier.

2. A device of the class described comprising a carrier member to which the end of a doctor blade may be fixed, and means carried by said member for successively engaging blade-retaining elements and positioning said retaining elements to receive said blade as said carrier member is moved therealong.

3. A device for positioning doctor blades relative to a series of fingers having blade-holding elements, which comprises a member having a slot of a width to receive said fingers and hold them in alinement as said device is drawn thereacross, the forward end of said slot being wide to permit a finger out of alinement to enter them, and tapering to draw said misalined finger into alinement as said device is drawn, said carrier having a blade-

receiving slot, and means for holding a blade in said slot in position to present said blade successively into cooperative relation with said holding elements as said carrier s drawn across said series of fingers.

4. A device for positioning doctor blades relative to a series of fingers having blade-holding elements spaced from one side thereof, which comprises a carrier having means with which said holding elements may engage as said carrier is drawn thereacross to thereby guide the movement of said carrier, means for successively engaging said fingers and alining the spaces between said fingers and holding elements as said carrier is moved, and means on said carrier for engaging a doctor blade and successively positioning it in said spaces as said carrier is moved.

5. A device of the class described comprising a carrier member to which the end of a doctor blade may be fixed, said carrier member having means for slidably guiding it relatively to one or more blade supports to permit it to be drawn in a path across said support positioned to present said blade into cooperative relation to blade-retaining elements carried by said supports.

6. A device for positioning doctor blades relative to a series of blade-retaining elements, which comprises a carrier for said blade, means for slidably guiding said carrier relatively to said elements to present said blade into cooperative relation to said elements, and means for sliding said carrier.

7. A device of the class described comprising a frame member having a guide channel extending along one face, means along one side of said channel for receiving the end portion of a doctor blade, means for clamping a blade in said receiving means, a block fixed to said member and having a portion spaced from said member to receive blade-holding means therebetween with blade-retaining elements on said holding means riding in said channel, and means engaging and acting to hold said clamp in clamping position for drawing said member across said fingers.

8. A device for positioning doctor blades relative to blade retaining means which comprises a carrier for said blade, and means on said carrier by which said carrier may be guided relative to said retaining means, to present said blades into cooperative relation to said retaining means as said carrier is drawn along said retaining means.

In testimony whereof I have affixed my signature.

FREDERICK W. VICKERY.