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SELF ADJUSTING PLUG SUPPORT

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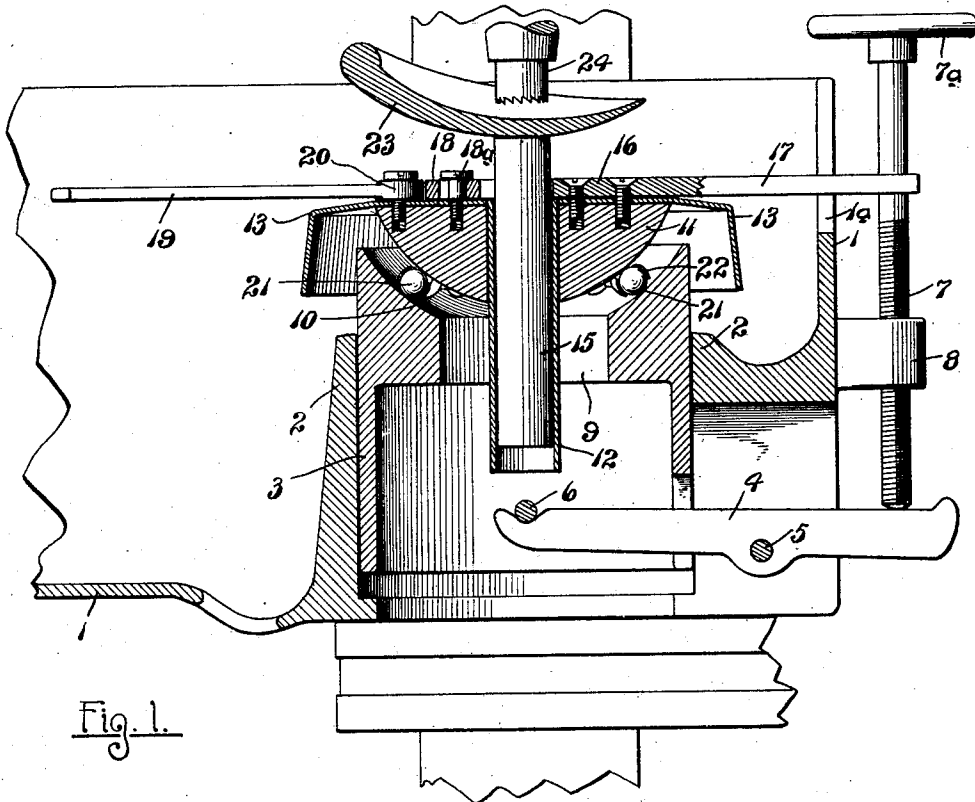


Fig. 1.

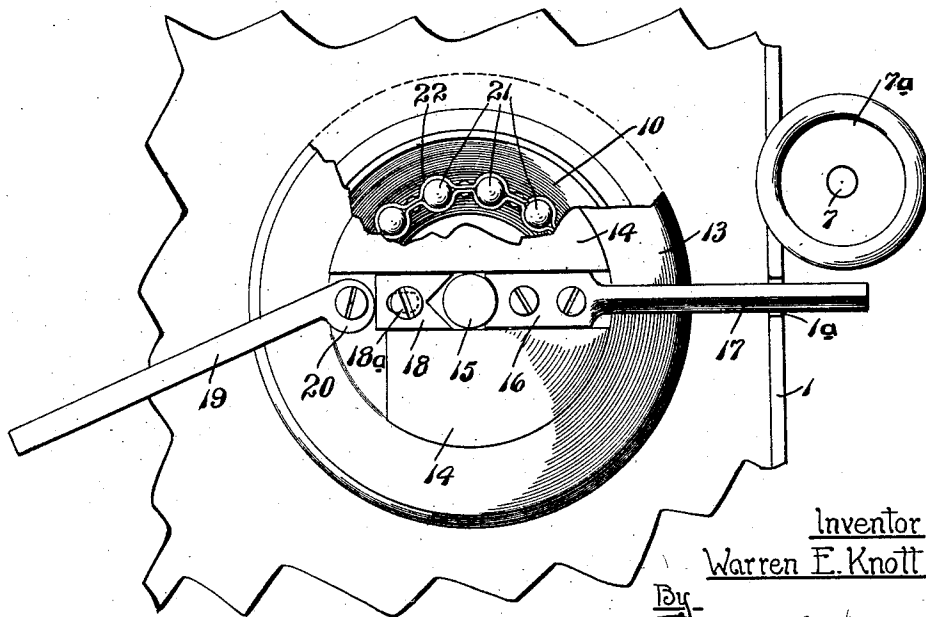


Fig. 2.

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SELF-ADJUSTING PLUG SUPPORT

Application filed May 11, 1927. Serial No. 180,406.

This invention relates to a self adjusting plug support particularly useful in button blank sawing machines. In the button blank sawing machine shown by my Patent No. 1,472,275, issued October 30, 1923, the saw which cuts the blank is moved in a downward direction so as to engage with the shell from which the blank is cut. In practice the shell is supported at its under side by a plug in order that the shell may have the firm backing and the saw cut thereinto.

The shells from which the blanks are cut are of irregular curved form having different curvatures at different parts thereof. The saw when it engages the shell in order for it to cut readily should engage the shell surface squarely. In order that it may engage the shell surface squarely and bite into the shell rather than scrape or slip thereover I have provided a mounting for the plug support which, when the pressure of the saw is brought against the shell, the shell bearing against the plug, automatically causes the plug and shell to take the required position wherein the surface sawed is disposed normal to the axis of the saw.

It is a primary object and purpose of the present invention to provide a practical device of this character to serve the end desired. Many other objects and purposes than those stated, particularly in the manner of adjusting the plug after the same is dressed from time to time at its upper end vertically so that its upper end will be disposed in the proper plane, and in also adjusting the plug holding device vertically to compensate for the shortening of the saws when the same are repeatedly filed and reset, will appear as understanding of the invention is had from the following description, taken in connection with the accompanying drawing, in which,

Fig. 1 is a fragmentary vertical section taken through the self adjusting plug support, and

Fig. 2 is a fragmentary plan view thereof, certain parts being broken away for better disclosure.

Like reference characters refer to like parts in the different figures of the drawing.

In the construction illustrated, a pan-like member 1 is used which is mounted on the button blank machine below the blank cutting saw. Integral with the pan a vertical guide is provided, as shown at 2, for guiding a cylindrical member 3 of metal which is supported by a lever 4 pivotally mounted between its ends on a pivot pin 5 carried by the member 1. The inner end of the lever 4 has a recess in its upper edge in which a rod or pin 6 extending across the member 3 seats. The outer end of the lever 4 extends beyond the pan 1 and is engaged at its upper edge by the lower end of a screw 7 which threads downwardly through a lug 8 projecting from a side of the pan 1. The screw at its upper end is equipped with a wheel 7^a for manual operation. It is evident that by operating the wheel the member 3 may be vertically adjusted in the guide 2.

The cylindrical member 3 has its upper end closed except for a central vertical opening 9 therethrough and the upper side is made with a concaved recess to provide a bearing surface 10 which is substantially the arc of a sphere, the center of which is located as nearly as may be at the upper end of the axis of the plug (later to be described) on which the shells are placed.

The immediate plug holding device comprises a block 11 of metal which is substantially a segment of a sphere, the curved surface of which is concentric with the curved surface of the bearing surface 10. A central opening is made downwardly through the block 11 in which a cylindrical sleeve 12 is secured. The sleeve extends a considerable distance below the lower side of the block 11 and through the opening 9 previously noted. At the upper flat side of the block 11 a protective apron 13 of sheet metal is located and secured, having downwardly extending flanges at its edges which cover the upper end of the member 3 and protect the same against the entrance of water or any foreign material which otherwise would likely pass between the block 11 and its supporting member 3.

Above the block 11 and apron 13 metal guides 14 are located and secured, the same

being spaced apart so as to provide a guide-way located diametrically across the upper side of the block 11. The plug 15 extends downwardly into the sleeve 12 and at its upper end extends a short distance above the upper side of the guides 14. Between the guides 14 at one side of the plug a flat member 16 is located and permanently secured, its inner end having a recess shaped to receive the adjacent side of the plug. At the outer end of the member 16 a handle 17 integral therewith is formed and extends outwardly through a vertical slot 1^a made in one side of the pan 1. At the opposite side of the plug 15 a movable jaw 18 is mounted between the guides 14 by means of a shouldered set screw 18^a which passes downwardly through a somewhat elongated opening made in the jaw 18, the opening being long enough to permit a limited sliding movement of the jaw. An operating handle 19 equipped at its inner end with an eccentric head 20 is pivotally mounted on the block 11 so that the head 20 comes against the outer end of the jaw 18. It is evident that by turning the handle in a counter-clockwise direction (referring to Fig. 2) the jaw may be moved inwardly to grip the plug 15 and force it against the end of the member 16. When moved in the opposite direction the plug 15 may be released so that it can be raised or lowered and thus adjusted to a position such that the upper end of the axis of the plug 15 is approximately the center about which the spherical surface 10 and the under surface of the block 11 are centered.

Between the lower curved side of the block 11 and the curved surface 10 at the upper end of the member 3 a plurality of balls 21 are located and are held by retainers 22 so that the same are in a circle around the plug 15. This provides an anti-friction bearing between block 11 and the upper end of the support 3 and one which is very sensitive so that the plug readily takes different positions and can be moved to any desired position that it will have to occupy when shells like that shown at 23 are placed against the upper end of the plug and the lower end of the saw 24 brought against the upper surface of the shell.

When this occurs should one edge of the saw engage with the upper surface of the shell 23 first there will be an immediate tilting of the plug so that the lower end of the saw will engage squarely against the upper side of the shell. This will occur because of the mounting shown and described permitting the plug to take different angular positions with respect to the vertical. The plug holding member is held against rotation when the saw cuts into the shell by reason of the arm 17 located in the slot 1^a. With the shortening of the saw which occurs after repeated sharpenings and

settings, the supporting member 3 has to be elevated and this is accomplished by operating the screw 7. When a new saw is applied to the machine the member 3 is lowered and is thereafter elevated as the saw becomes shortened in use.

The construction described is practical for the purposes for which it is designed and has proved its value in actual practice. The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within the scope of said claims.

I claim:

1. In a construction of the class described, a supporting member, a plug support located above the supporting member, anti-friction balls disposed between the under side of the plug support and the upper side of the first named support, the upper end of said first named support having a concave recess therein and the lower side of the plug support being curved to correspond therewith, a vertical plug extending downwardly through the plug support and at its upper end extending a short distance thereabove, a member attached to the upper side of the plug support against which one side of the plug bears, a clamping jaw slidably mounted on the plug support on the opposite side of the plug, and manually operable means for moving said clamping jaw against the plug.

2. In a construction of the class described, a vertical support having a relatively large vertical opening therethrough and at its upper end formed with a relatively large concaved recess, the surface of which is a segment of the surface of a sphere, a plurality of balls disposed in a circle in said recess around the vertical opening through said support, a ball retainer of circular form in which said balls are held, said balls and retainer being freely movable on said surface, a block having a flat upper side and a curved lower side substantially concentric with the surface of said recess disposed with the curved lower side of said block lying against the balls, said block having a vertical opening therethrough of less diameter than the diameter of the opening in said vertical support, and a cylindrical plug extending downwardly through the opening in said block and through the opening in the support, the upper end of said plug extending a short distance above the upper side of the block.

3. A device of the class described comprising, a base member, a non-rotatable support vertically adjustable on the base member, a plug support, means for mounting said plug support for universal tilting movement on said non-rotatable support and means on the plug support engageable with means on the base member to prevent rotation of the plug support on a vertical axis, said means per-

mitting vertical adjustment and universal tilting movement of the plug support.

4. A device of the class described comprising, a base member having a vertical slot, a non-rotatable support mounted for vertical
5 adjustment in said base member, a plug support, means for mounting said plug support for universal tilting movement in said non-rotatable member and an arm projecting from
10 said plug support and slidably extending through said slot in the base member whereby the plug support is held from rotation but is permitted vertical adjustment and universal tilting.

15 In testimony whereof I affix my signature.
WARREN E. KNOTT.

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