Dec. 27, 1949 T. R. STENBERG ET AL 2,492,602

HAND SANDER

Filed Nov. 8, 1948 2 Sheets-Sheet 1

Fig. 1.

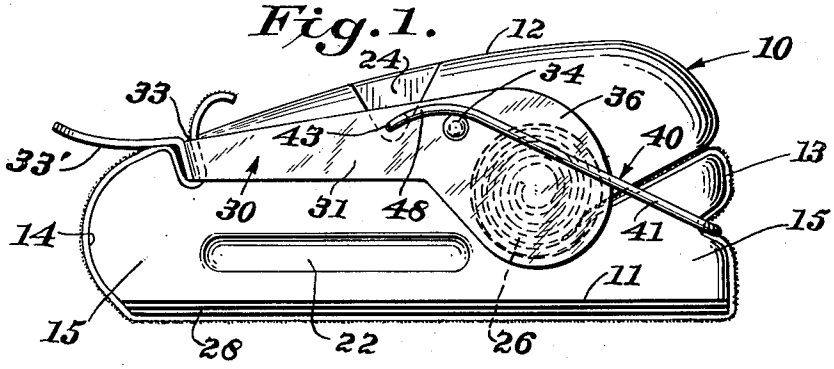


Fig. 2.

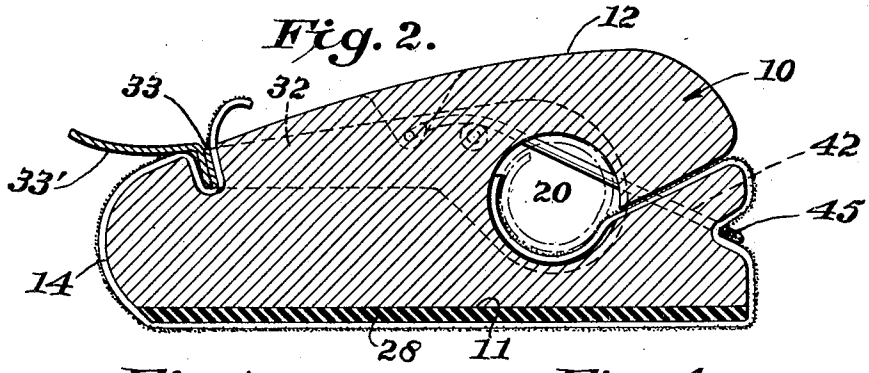


Fig. 3.

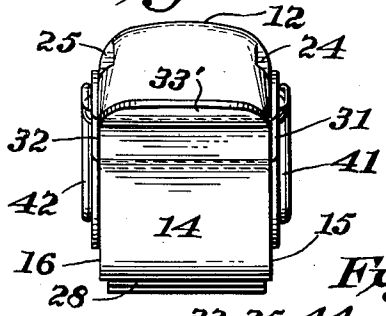


Fig. 4.

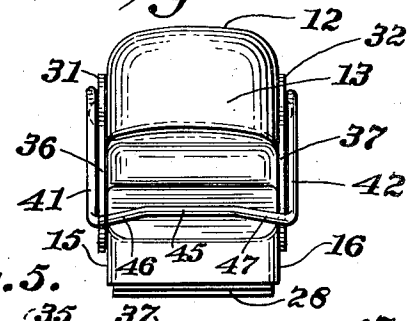
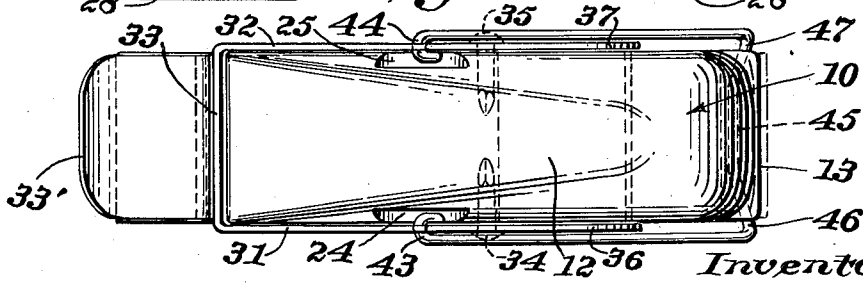


Fig. 5.



Inventors:
Thornton R. Stenberg,
Fred T. King, and
Milton Immermann,
By Cushman, Darby & Cushman
Attorneys.

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Fig. 6.

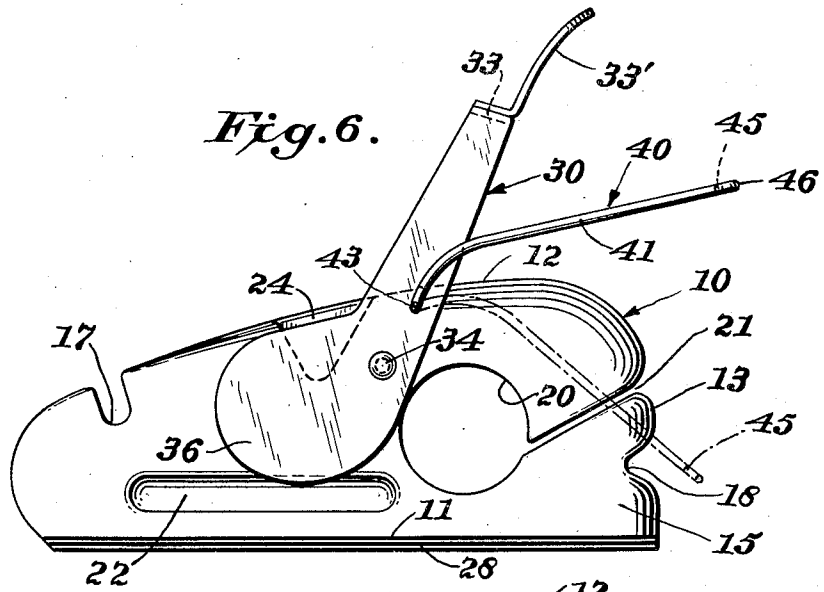


Fig. 7.

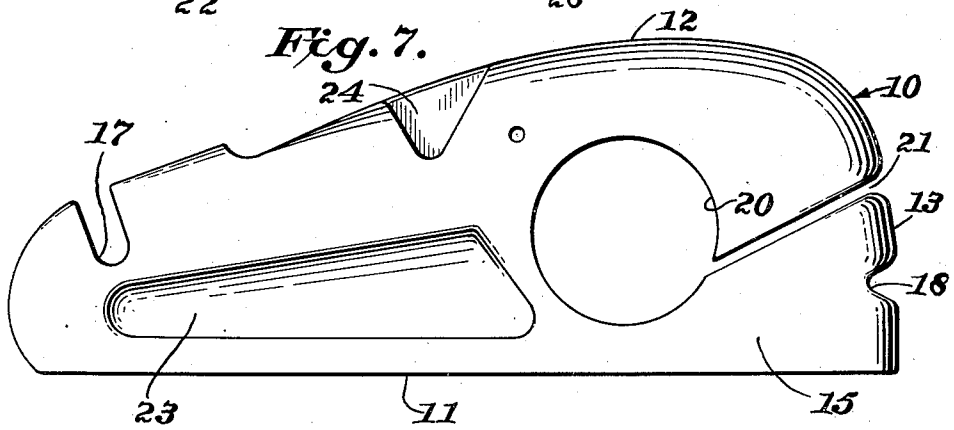


Fig. 8.

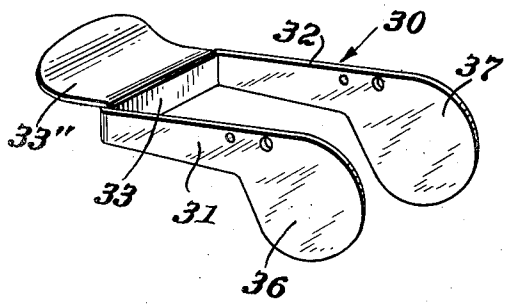
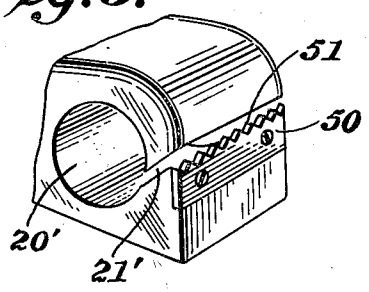


Fig. 9.



Inventors:
Thornton R. Stenberg,
Fred T. King,
Milton Immermann,
By Cushman, Darby & Cushman,
Attorneys.

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2,492,602

HAND SANDER

Thornton R. Stenberg, Troy, Fred T. King, Larchmont, and Milton Immermann, Piermont, N. Y., assignors to Behr-Manning Corporation, Troy, N. Y., a corporation of Massachusetts

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13 Claims. (Cl. 51—187)

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The present invention relates to an abrasive implement of the type in which a strip of coated abrasive, such as sandpaper, abrasive cloth, and the like, is securely held against a surface of a body or block, so that the latter may be conveniently grasped by the user and employed in various abrading operations. Implements of this general class are widely used in the home and in various industries and arts and generally comprise some sort of body or block, with means for clamping an abrasive strip against the working surface thereof. Many include a chamber or receptacle for a reserve supply of abrasive strip material in coiled form. Since such devices are well understood in the art, a further description of their use and advantages is unnecessary.

The primary object of the present invention is to simplify the construction of hand sanders, to the end that they may be produced at a minimum cost, without sacrificing any of the essential or desirable features thereof.

A further object of the invention is to provide an improved and simplified mechanism for clamping and tensioning a coated abrasive strip in operative relation upon the body or block of a hand sander.

Another object is to provide an improved body or block construction providing an improved receptacle or chamber for a reserve supply of abrasive strip material.

Another object is to provide a body or block which cooperates with the clamping and tensioning mechanism in an improved manner so that the latter mechanism performs the additional function of closing and opening the chamber for the reserve supply of strip.

In carrying out the objects of the invention, an extremely simple device has been provided, consisting essentially of only three parts, constructed and arranged to perform the necessary functions of prior devices, all of which have been more complicated and expensive to manufacture.

In the accompanying drawings, certain illustrative embodiments of the invention are shown, in which:

Figure 1 is a side elevation of a hand sander;

Figure 2 is a vertical, longitudinal section substantially through the center of Figure 1;

Figure 3 is a front elevation of Figure 1, looking toward the left end thereof;

Figure 4 is a rear elevation of the device of Figure 1, looking toward the right end thereof;

Figure 5 is a plan view;

Figure 6 is a view similar to Figure 1, with the abrasive strip removed and with the tensioning and clamping mechanism in the inoperative position;

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Figure 7 is a side elevation of the body or block, with the clamping and tensioning mechanism removed;

Figure 8 is a perspective view of a preferred form of primary locking yoke, and

Figure 9 is a fragmentary elevation of a modified form of block.

In the drawings, the body block 10 is indicated as made of a single, solid piece of suitable material, such as wood, cast metal, plastic or the like, but it must be understood that the block may, if desired, be fabricated from a plurality of pieces, particularly if made of molded plastic, as will be well understood by those skilled in the plastic molding art. The block or body includes a plane bottom surface 11, a somewhat rounded and forwardly and downwardly pitched top wall surface 12, a rear end wall 13, a front end wall 14, and side walls 15 and 16. The top wall adjacent the forward end is shaped to provide a substantially vertical channel 17, while the rear end wall is also provided with a horizontal, transverse channel 18.

The body has formed therein a chamber 20 of substantial size opening through the side walls 15 and 16, and communicating with the rear end wall 13 through a slot 21, above the channel 18 therein.

The side walls of the block may be relieved as at 22 or 23 to provide finger grip recesses adjacent the bottom wall 11. Also, the side walls may be provided with generally V-shaped recesses 24, 25 adjacent the top surface 12, for a purpose hereinafter explained.

The chamber 20 constitutes a receptacle for a reserve supply of coated abrasive strip in coil form as indicated at 26 in Figures 1 and 2. The free end of the strip is adapted to be threaded through the slot 21, bent downwardly over the end face 13, led forwardly under the bottom 11, upwardly over the front face 14 and rearwardly over a portion of the top surface 12, beyond the channel 17.

Preferably the bottom surface 11 of the block is provided with a layer of substantial thickness of rubber or similar resilient material, as indicated at 28, to provide a semi-soft backing for the abrasive strip and to enable the abrasive surface to conform somewhat to the work.

The means for tensioning and clamping the abrasive strip in place comprises a double link toggle, including a pair of yokes, one pivoted to the block and the other to the first yoke, so

that the swinging movement of one yoke to locking position draws the other yoke into locking position and moves the toggle links past dead center, to maintain the assembly in locked position. In the embodiment illustrated, the first yoke 30 includes a pair of parallel, sheet metal legs 31 and 32, interconnected by an integral transversely bent, blade-like head 33. The legs are pivotally connected to the side faces of the body by pins 34, 35 or the like and are provided with rearwardly and downwardly projecting, plate extensions 36, 37 which serve as closures for the open ends of the chamber 20 when the parts are in the position shown in Figures 1–5.

The second link 40 of the toggle mechanism may comprise a relatively stiff spring wire yoke or bail, including legs 41 and 42, having their free ends hooked through appropriate openings in and pivotally connected to the legs 31 and 32 of the first yoke, as indicated at 43 and 44, at points spaced forwardly of the fulcrum constituted by pins 34 and 35. The recesses 24 and 25 accommodate the bent ends 43 and 44 of wire yoke in the downward movement thereof, as indicated in Figure 5. The legs 41 and 42 are interconnected at their rear ends by an integral transversely extending head portion 45, which may include angular end sections 46 and 47 as indicated in Figures 4 and 5, to impart resiliency to the bail as a whole. For the same purpose, the forward ends of the legs 41, 42 may be forwardly and downwardly curved as indicated at 48.

When the primary toggle link or yoke 30 is swung forwardly and downwardly from the position shown in Figure 6, the blade-like head 33 thereof enters the channel 17 in the top surface. If a coated abrasive strip has previously been laid over this channel, the head will force the same thereinto and will apply tension to the strip. The head of the spring wire bail, positioned as indicated in dotted lines in Figure 6, will be drawn forwardly by the forward and downward swinging movement of the yoke 30, with the result that its head 45 enters the channel 18 and clamps the coated abrasive strip overlying said channel. The parts are so proportioned that, as the head 33 approaches the channel 17, in its forward and downward swinging movement, the head 45 of the other yoke enters the channel 18 and clamps the strip therein. Tension may be applied manually to the free end of the strip in a rearward direction along the top surface 12 of the block while the strip is thus clamped against the rear end face of the block. Continued downward swinging movement of the first yoke forces the head 33 thereof and the underlying strip into the channel 17, thereby further tensioning and finally clamping the strip in place against the bottom surface of the resilient pad 28.

Simultaneously with the locking and clamping of the strip, the ends 36 and 37 of the yoke 30 swing upwardly and close the ends of the chamber or receptacle 20 for the coiled abrasive strip.

When the portion of the abrasive strip below the pad 28 has become worn, it may be replenished by simply raising the yoke 30, thereby releasing the head 31, from a channel 17 and the head 45 of the yoke 40 from the channel 18. An appropriate length of strip may then be pulled outwardly through slot 21, wrapped downwardly over the end wall 13, forwardly under the bottom layer 28, and upwardly over the front portion of the top wall, beyond channel 17. The yokes may then be shifted to the position shown in Figure 1 to clamp the new strip in place and the worn end portion of the abrasive strip torn off and discarded.

The head 33 of the yoke 30 may be provided with a forwardly and upwardly projecting extension 33', adapted to serve as a finger piece or rest for the hand of the user so that, as pressure is applied to the implement at the forward end thereof through the extension 33, the normal tendency is to maintain the toggle mechanism in locked position.

By reference to Figures 1 and 2, it should be noted that, when the parts are in the locked position, the toggles have swung past dead center. In other words, the fulcrum of yoke 30 (on the axes of pins 34 and 35) is positioned above a straight line drawn between the pivotal connections 43 and 44 of the toggle link 40 and the point of application of pressure by the head 45. The yokes or toggle links in moving to their locking position are permitted to swing past the dead center position by the resiliency of the yoke 40. Hence, they are maintained in the locked position by spring tension and there is no tendency for the parts to become released.

In the modification shown in Figure 9, the yoke 40 may be eliminated and a plate 50 may be secured to the rear end face of the block, adjacent the slot 21'. The plate has a plurality of teeth 51 which grip the abrasive strip bent sharply thereover, and prevent further uncoiling thereof. In this case, the lever yoke 30 acts as previously described, to close the ends of the chamber 20' and to clamp the opposite end of the strip in the channel formed in the upper surface of the block. Moreover, the tension applied to the strip by the head 33 forces the strip downwardly upon the gripping teeth 51 and causes them to become embedded in the strip.

The forwardly and upwardly projecting extension 33', serving as a finger piece, as previously described, may be constituted by a separate piece, welded, riveted, or otherwise secured to the head 33, as indicated in Figures 1, 2, and 6, or may consist simply of an integral extension of the head 33, as indicated at 33'' in Figure 8.

It should be understood that the invention is not limited to the details of construction and shape or proportion of parts shown in the accompanying drawings and described above, but includes all variations and modifications coming within the scope of the appended claims and their equivalents.

We claim:

1. A hand sander comprising an elongated block shaped to provide a substantially planar bottom working surface, upstanding side and end faces, and a top surface, one end face having a transverse channel and the top face having a transverse channel adjacent the opposite end thereof, and means for tensioning and clamping a coated abrasive strip in the channels and along said bottom surface, comprising a pair of U-shaped yokes, one having its legs pivoted on a fixed axis, directly to the side faces of the body for swinging movement of its head into one channel and the other yoke having its legs pivoted to the legs of the first yoke between the fulcrum and the head thereof, the head of the second yoke being positioned to be drawn into the other channel as the head of the first yoke is swung toward and into said one channel.

2. A hand sander comprising an elongated block shaped to provide a substantially planar bottom working surface, upstanding side and end faces, a top surface and a receptacle for an

abrasive strip having a delivery opening in one end face, said end face having a transverse channel below the delivery opening and the top face having a transverse channel adjacent the opposite end thereof, and means for tensioning and clamping a coated abrasive strip in the channels and along said bottom surface, comprising a pair of U-shaped yokes, one having its legs pivoted on a fixed axis to the side faces of the body for swinging movement of its head into one channel and the other yoke having its legs pivoted to the legs of the first yoke between the fulcrum and the head thereof, the head of the second yoke being positioned to be drawn into the other channel as the head of the first yoke is swung toward and into said one channel.

3. A hand sander comprising an elongated body shaped to provide bottom, top, side and end faces, said top face having a channel adjacent one end, and the end face remote therefrom having a transverse channel therein, said body having a chamber in the interior opening through said end face above the channel, whereby a strip of coated abrasive coiled in the chamber may be drawn through the opening and wrapped around the block over said channels and under the bottom working surface thereof, and means for tensioning and clamping the strip, comprising a pair of U-shaped yokes, one pivoted on a fixed axis, directly to the side faces of the block for swinging movement of its head into one channel to force the strip thereinto, the other pivoted to the first yoke with its head positioned to be drawn into the other channel by the pivoting movement of the first, to draw the strip thereinto.

4. A hand sander comprising a block having an interior chamber communicating with an end face through a slot therein, said chamber constituting a receptacle for a coiled abrasive strip adapted to be threaded through the slot and wrapped downwardly over said end face under the bottom of the block and upwardly over a portion of the top face thereof, and means for tensioning and clamping the strip in said position, comprising a yoke having its legs disposed in parallel relation to the side faces of the block and pivoted on a fixed axis, directly thereto and a head adapted to be swung downwardly onto the strip disposed along the top face in clamping relation thereto, and a second yoke having its ends pivoted directly to the legs of the first mentioned yoke between the fulcrum and the head thereof, and having its head positioned to be drawn against said end face in clamping relation to the strip, upon downward swinging movement of the first mentioned yoke.

5. A sander in accordance with claim 4 characterized in that the legs of the first yoke are extended on the opposite sides of the fulcrum from the head and constitute closures for the ends of said receptacle when the head thereof is swung downwardly.

6. A hand sander comprising a block having a horizontally disposed, transverse chamber therein opening through the side faces and communicating with one end face through a slot therein and constituting a receptacle for a coiled coated abrasive strip adapted to be threaded through the slot and wrapped downwardly over said end face, under the bottom of the block and upwardly over a portion of the top face thereof, said end face having a transverse channel below said slot and said top face having a channel adjacent the opposite end, and means for tensioning and clamping the strip in said position, comprising a sheet metal yoke having its legs disposed in parallel relation to the side faces of the block and pivoted thereto on a fixed axis and a blade-like head adapted to be swung downwardly into the channel in the top face, and a bail yoke having its ends pivoted directly to the legs of the first mentioned yoke between the fulcrum thereof and the head, and having its head positioned to be drawn into the end face slot upon downward swinging movement of the first mentioned yoke.

7. A hand sander comprising a block having bottom, top, side, front, and rear end walls, the block being shaped to provide a transversely disposed chamber opening through the side walls and a slot communicating with the chamber and opening through the rear end wall, said chamber forming a receptacle for a coil of coated abrasive strip, said rear end wall having a transverse channel below the slot and the top wall having a transverse channel adjacent the front end thereof, and means for clamping a strip against the bottom wall, comprising a double yoke toggle, one yoke being pivoted directly to the side walls on a fixed axis for forward and downward swinging movement of its head into the top wall channel and the other yoke being pivoted directly to the legs of the first yoke, ahead of its fulcrum, for forward longitudinal movement of its head into the rear wall channel upon said movement of the first yoke.

8. A hand sander comprising a block having bottom, top, side, front, and rear end walls, the block being shaped to provide a transversely disposed chamber opening through the side walls and a slot communicating with the chamber and opening through the rear end wall, said chamber forming a receptacle for a coil of coated abrasive strip, said rear end wall having a transverse channel below the slot and the top wall having a transverse channel adjacent the front end thereof, and means for clamping a strip against the bottom wall, comprising a double yoke toggle, one yoke being pivoted on a fixed axis to the side wall for forward and downward swinging movement of its head into the top wall channel and the other yoke having the free ends of its legs directly pivoted to the first yoke, ahead of its fulcrum, for forward longitudinal movement of its head into the rear wall channel upon said movement of the first yoke, the toggle being movable past dead center for locking and the second yoke being resilient to permit such movement and to hold the yokes in locked position under spring tension.

9. A hand sander comprising a block having bottom, top, side, front, and rear end walls, the block being shaped to provide a transversely disposed chamber opening through the side walls and a slot communicating with the chamber and opening through the rear end wall, said chamber forming a receptacle for a coil of coated abrasive strip, said rear end wall having a transverse channel below the slot and the top wall having a transverse channel adjacent the front end thereof, and means for clamping a strip against the bottom wall, comprising a double yoke toggle, one yoke being pivoted to the side wall for forward and downward swinging movement of its head into the top wall channel and the other yoke being pivoted to the first yoke, ahead of its fulcrum, for forward longitudinal movement of its head into the rear wall channel upon said movement of the first yoke, the first yoke including closure plate extensions, movable upwardly upon downwardly swinging movement of

the yoke to close the side wall openings of said chamber.

10. A sander in accordance with claim 7 characterized in that the head of the first mentioned yoke includes an upwardly and forwardly projecting finger-piece plate, adapted to receive pressure from the hand of the user to maintain the yoke in clamping relation and to transmit force to the work.

11. A sander in accordance with claim 7 characterized in that the first mentioned yoke comprises a strip of sheet metal bent to U-shape, with its legs disposed in parallel relation to the side walls of the block and having rearward extensions adapted to close the ends of the chamber.

12. A hand sander comprising a block having bottom, top, side, front and rear walls, the rear wall having a transverse channel therein and the top wall having an upwardly opening, vertically disposed transverse channel adjacent the front end thereof, and means for clamping a strip of abrasive material in said channels and against the bottom wall of the block, said means comprising a double yoke toggle, one yoke being pivoted to the side walls for forward and downward swinging movement and having a blade-like head arranged to swing substantially vertically into the top wall slot, to force the strip thereinto and to apply tension thereto, the other yoke having the free ends of its legs directly pivoted to the

first yoke ahead of its fulcrum for forward longitudinal movement of its head into the rear wall channel upon said movement of the first yoke, to clamp the strip therein.

13. A sander in accordance with claim 12 characterized in that the head of the first mentioned yoke includes a forwardly and upwardly projecting extension adapted to serve as a finger piece, to receive pressure from the hand of the user and to maintain said head in the slot.

THORNTON R. STENBERG.
FRED T. KING.
MILTON IMMERMANN.

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