March 23, 1965 J. A. KENNY 3,174,258

GLASS POLISHING TOOL

Original Filed Aug. 1, 1960

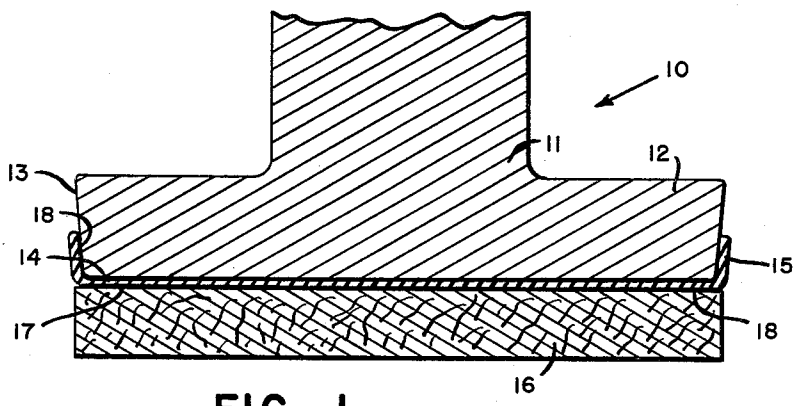



FIG. 1

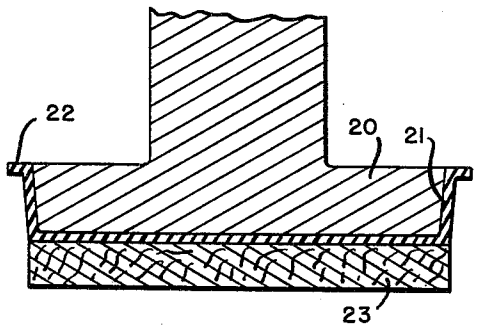



FIG. 3

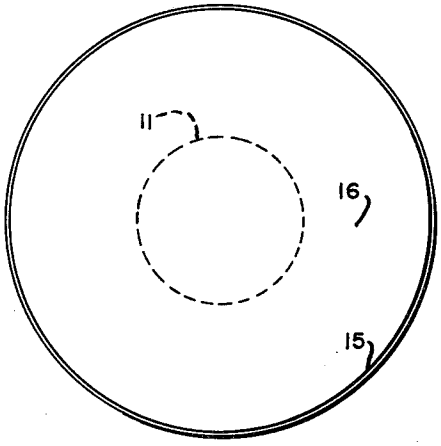



FIG. 2

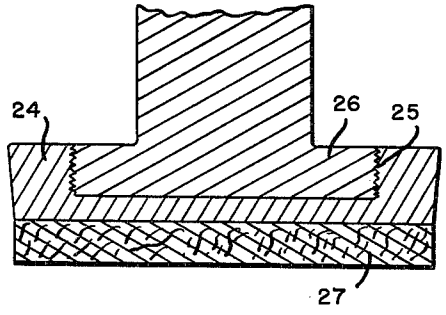



FIG. 4

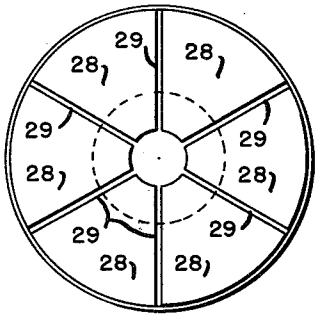



FIG. 5

INVENTOR.
JOSEPH A. KENNY
BY
Robertson & Sanger
ATTORNEYS.

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3,174,258

# GLASS POLISHING TOOL

Joseph A. Kenny, Greenwich, Conn., assignor to American Felt Company, Glenville, Conn., a corporation of Massachusetts

Continuation of application Ser. No. 46,766, Aug. 1, 1960. This application Dec. 24, 1962, Ser. No. 246,795
2 Claims. (Cl. 51—389)

The present invention relates to the art of polishing the plate glass, and particularly to a new and improved combined felt pad and attaching means for use with polishing heads of glass polishing machines.

This application is a continuation of application Serial No. 46,766, filed August 1, 1960, in the name of Joseph A. Kenny, and now abandoned.

It is presently customary to employ square shaped felt pads having a size such that an inscribed circle of the square equals the diameter of the round polishing head of a glass polishing machine. The exposed corners of the square felt pad are bent upwardly about the peripheral edge of the head, and a metal band is clamped about these bent-up edges, thereby securely holding the felt pad to the polishing head. Circular felt pads also have been secured to the polishing head by a cementing process employing hot pitch or other similar adhesives.

The bent-up corners of prior known polishing pads provide a point of weakness, and the pads often tear at such corners, rendering them useless long before the normal life of the felt has been consumed. Furthermore, such square pads require a high percentage of unusable felt in the bent-up corner portions.

Cementing felt pads directly to the iron polishing head is unsatisfactory because the "down time" of a polishing machine to effect replacement of such a pad is excessive. It involves the removal of an adhering pad from a polishing head, the cleaning of the head, the applying of fresh adhesive to the head, and the application of a new felt which requires a predetermined curing time before the polishing machine can be restarted. When it is considered that there are many polishing heads in one machine and that felt replacement usually is necessary to less than the total number of heads at a time, it becomes apparent that rapid replacement of felts is an essential requirement.

An important object of this invention is to provide a combined felt pad and attaching means for the heads of glass polishing machines which can be replaced with a minimum of "down time" of the polishing machine.

Another object of this invention is to provide such a felt and attaching means which will substantially reduce labor costs in replacing the same.

Still another object of this invention is to provide such a felt and attaching means in which a minimum of felt is required for maximum polishing action.

Another object of the invention is to provide such a felt and attaching means which may be either disposable or re-usable.

Still another object of the invention is to provide such a felt and attaching means in which the natural oil or grease of the felt fibers is retained, thereby eliminating excessive penetration of abrasive and the consequent embrittlement of the felt pad.

In one aspect of the invention, a circular cap-like member may be made from a semi-rigid plastic material which may be provided with a peripheral side wall having a slight internal bevel adapted to snugly fit the outer peripheral edge of the cast iron head of the polishing machine.

In still another aspect of the invention, the plastic cap may be attached to the polishing head by a band or by cementing with hot pitch or other equivalent adhesive.



In still another aspect of the invention, a flanged cap-like member may have an internal diameter capable of snugly receiving a glass polishing head. This member may be made from hard rubber having good tensile and impact strength, or it may be made from compressed fiber board known as "Masonite." A felt polishing pad may be securely attached to the outside bottom surface of the cap member by cementing or otherwise, and the assembly may be removably attached to the polishing head by an easily removed band or the like surrounding the wall of the cap-shaped member.

In still another aspect of the invention, a cap-shaped member may have its inner wall provided with screw threads adapted to be threaded onto a polishing head having mating threads on its peripheral edge.

In still another aspect of the invention, segmentally shaped felt pad means may be attached to the outer bottom plane surface of a cap-shaped plastic or other member slightly spaced circumferentially to provide radial grooves between adjacent segmental pad means.

The above, other objects and advantages of the polishing felt and attaching means will become apparent from the following specification and accompanying drawing which is merely exemplary.

In the drawing:

FIG. 1 is a sectional elevational view of a polishing head of a glass polishing machine to which the principles of the invention have been applied;

FIG. 2 is a bottom plan view of the polishing head shown in FIG. 1;

FIG. 3 is a modified form of the invention;

FIG. 4 is a still further modified form of the invention; and

FIG. 5 is another modified form of the invention.

Referring to the drawings, and particularly to FIGS. 1 and 2, the principles of the invention are shown as applied to a polishing head **10** of a glass polishing machine. The head **10** may be made of cast iron and may include a spindle **11** to which a disk or cylindrical member **12** is integrally attached. The outer peripheral edge **13** of disk **12** may be beveled slightly inwardly for a purpose to be described later. There are usually many such heads in a glass polishing machine. Normally, the disk **12** may be about 27 inches in diameter and about 3 inches thick. In operation, the heads **10** rotate slowly and at random about their own axes, while moving around a circle which may be about ten feet in diameter. Additionally, these heads may be given a vertically reciprocable motion during the polishing action to ensure a copious quantity of the abrasive, which may be rouge or cerium oxide slurry, being fed between the polishing head **10** and the glass being polished. This reciprocable motion causes a pumping action to the felt pads mechanically held to the disk **12**. This permits excessive penetration of the abrasive into the felt, resulting in the loss of the natural oil or grease of the felt fibers and consequent embrittlement of the felt.

In the present invention, and as shown in FIGS. 1 and 2, a cap **14** may be molded from any semi-rigid plastic such as the thermoplastic materials, polyethylene, styrene polymers and copolymers, vinyls, acrylics, cellulosics and the like. It may also be molded from resins reinforced with pulp, paper or fibers such as glass, cotton, sisal and the like in either woven or non-woven form.

The cap **14** may include an upwardly extending peripheral wall **15** having a slight outward bevel adapted to receive the beveled edge **13** of the disk **12**. The thickness of the section of the cap **14** may be such as to provide the desired amount of strength, stiffness, and impact resistance necessary to meet the demands of the reciprocative action of the head **10**.

A felt pad **16** which may be made of a blend of cattle

hair and wool, or any of the other well known felting blends of hair, may be formed into a circular disk of a diameter substantially equal to that of the cap **14**. The pad **16** may be laminated or cemented to the outer surface of the cap **14** by a layer **17** of an appropriate cement, such as polystyrene cement, or by applying acetone to the outer plane surface of the plastic cap, thereby producing a tacky adhesive condition to which the felt pad **16** will adhere.

In practice, the cap **14** may be attached to the disk **12** by a layer **18** of an appropriate adhesive such as hot pitch, pressure-sensitive adhesive or the like. Alternatively, the cap **14** may be attached to the disk **12** by an appropriate clamping device such as a metal ring or band surrounding the outer wall **15** of the cap **14**.

From the foregoing, it is evident that when the replacement of a felt pad **16** is required, the semi-rigid plastic cap **14** may be rapidly removed from the disk **12** and replaced with a new one with a minimum of "down time" of the polishing machine; that a minimum of felt is required for maximum polishing action as compared with prior known square shaped felt pads where the bent-up corners are not utilized to polish the glass; that the cap **14** being of molded plastic may be disposable or re-used; and that the tearing of the bent-up corners of square felt pads is eliminated.

Furthermore, wtih the attaching device of this invention, grooved felt polishing pads can be made by cementing spaced cut segments of hair felt to the plastic cap, thereby providing a more economical use of felt by eliminating the waste resulting from cutting into the polishing pad. Additionally, the cementing of the felt pad to the plastic cap **14** eliminates any pumping action due to the reciprocation of the heads during polishing, thereby tending to retain the natural oil or grease of the hair fibers and reducing the embrittlement of the pad caused by excessive penetration of the abrasive into the pad.

Referring to FIG. 3, the principles of the invention are shown as applied to a polishing head **20** similar to the head **10** of FIG. 1. A cap-shaped member **21** may be provided with a flange **22**, and it may be made of hard rubber, paper pulp, or pressed fiber board such as sold under the trademark "Masonite" having adequate tensile and impact strength; or it may be made from any of the materials disclosed for the member **14** of FIG. 1. The cap-shaped or cup-shaped member **21** may have a felt polishing pad **23** fixed to its outer bottom surface by a suitable pressure-sensitive adhesive or by other attaching means. The felt pad **23** may be similar to pad **16** of FIG. 1. Although the bottom of member **21** is shown in FIG. 3 as being solid, it may be provided with a hole extending therethrough of any suitable diameter. The internal diameter of member **21** may be such as to snugly fit the peripheral edge of the head **20**.

The assembled member **21** and pad **23** may be removably fixed to the head **20** by an appropriate adhesive such as hot pitch, pressure-sensitive adhesive or the like. Alternatively, the member **21** may be attached to head **20** by an appropriate clamping device such as a removable metal ring or band surrounding the outer wall of the member **21**.

Referring to FIG. 4, a cap-shaped member **24** having internal threads thereon may be threaded onto mating threads **25** on the peripheral edge of a polishing head **26**. It also may be made of the same material as the member **21**, and a felt polishing pad **27** similar to pad **23** may



be attached to the member **24** in the same way that pad **23** is attached to member **21**. In place of the internal threads, screws (not shown) could be threaded into the wall **24** in a direction parallel to the face of the pad.

As discussed in copending application Serial No. 46,828, filed August 1, 1960, in the name of Harold G. Hencken, and referring to FIG. 5, any one of the cap-like members **14**, **21** or **24** may have felt segments **28** adhesively or otherwise fastened to the outer plane surface of the cap-like members in spaced relation, forming radial grooves **29** therebetween. This construction provides a more economical use of the felt by eliminating the waste resulting from known methods of cutting grooves into the polishing pad.

Although the various features of the new and improved felt polishing pad and attaching means for glass polishing machines have been shown and described in detail to fully disclose several embodiments of the invention, it will be evident that changes may be made in such details and certain features may be used without others without departing from the principles of the invention.

What is claimed is:

1. In a glass polishing machine, a cylindrical polishing head of metal having a spindle integrally attached thereto, said head being relatively thick so as to provide a relatively wide axially extending, peripheral edge surface; a cap-shaped non-metallic member removably attached to said metal head including a relatively thin circular, disk-like portion having an integral upstanding peripheral wall completely surrounding said circular portion and adapted to mate with the axially extending peripheral edge surface of said head; said cap being molded from a semi-rigid plastic selected from the group, consisting of polyethelene, styrene polymers and copolymers, vinyls, acrylics and cellulosics; a felt polishing pad substantially thicker than that of said thin disk-like portion adhesively secured to the outer bottom plane surface of the disk-like portion of said non-metallic member; and means for holding the inner surfaces of said circular portion and upstanding wall in intimate and direct contact with corresponding mating surfaces on said head.

2. In a glass polishing machine, a cylindrical polishing head of metal having a spindle integrally attached thereto, said head being relatively thick so as to provide a relatively wide axially extending, peripheral edge surface, said peripheral edge being provided with screw threads thereon; a cap-shaped non-metallic member removably attached to said metal head including a relatively thin circular disk-like portion having an integral upstanding peripheral wall completely surrounding said circular portion and having internal threads thereon adapted to receive the threads on the peripheral edge of said head; said cap being molded from a semi-rigid plastic selected from the group consisting of polyurethane, styrene, polymers and co-polymers, vinyls, acrylics, and cellulosics; and a felt polishing pad substantially thicker than that of said thin disk-like portion adhesively secured to the outer bottom plane surface of said disk-like portion of said non-metallic member.

**References Cited by the Examiner**

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J. SPENCER OVERHOLSER, *Primary Examiner.*

LESTER M. SWINGLE, *Examiner.*