GLASS POLISHING HEAD HAVING A DETACHABLE FELT PAD
William F. Armstrong, Newburgh, N.Y., assignor to American Felt Company, Glennville, Conn., a corporation of Massachusetts
Filed Feb. 17, 1964, Ser. No. 345,216
2 Claims. (Cl. 15—250.12)

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

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. Such felt pads also have been secured to the polishing head by a cementing process employing hot pitch or other 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 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, it becomes apparent that the 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 disposable.

In one aspect of the invention, a glass polishing head may comprise a disk of metal having a centrally disposed stem or spindle extending from the disk at right angles thereto. The stem is adapted to be connected to rotating means within a glass polishing machine, which rotating means may be reciprocable axially of the stem to raise and lower the polishing head from contact with the glass being polished.

In another aspect of the invention, a flexible sheet having a large number of closely spaced hooking elements made from flexible resilient fibers may be attached to the face of the glass polishing head opposite that from which the stem or spindle extends. The hooking elements may be made from any flexible resilient fiber that will stand erect. One form of sheathing is a woven nylon textile having upstanding loops that have been cut to form hooks.

Such material is shown, described and claimed in U.S. Patents 2,717,437 and 3,009,235.

The hooked material may be permanently attached to the face of the polishing head by an adhesive. For example, the textile backing containing the hooks may be pre-coated with a solvent activated precoat which, prior to being applied to the metal surface, is treated with a solvent such as methyl ethyl ketone. Applying the hooked textile to the face of the polishing head securely and tenaciously unites the two.

In another aspect of the invention, a felt polishing pad of the exact diameter of the metal polishing head may have attached to its back face a woven textile sheet having a great number of upstanding loops thereon such as disclosed in the above-referred-to patents. This looped textile sheet may be attached to the felt pad by stitching, stapling or employing an adhesive such as by having a solvent or heat activated precoat on the back face of the looped textile sheet. Methyl ethyl ketone can be employed as an activating solvent or heat can be used as an activating means.

It has been found that firmly pressing the face of the felt pad having the looped textile sheet against the hooked surface of the textile sheet on the polishing head causes the felt pad to be securely held to the head by the mechanical interlocking of the hundreds of hooks and loops. It has also been found that such a connection provides exceptionally high torsional holding power, which is particularly desirable in the polishing of glass.

In still another aspect of the invention, the hooked and looped textile sheeting may be applied to either the polishing head or the felt pad, but preferably the hooked textile is applied to the polishing head.

In still another aspect of the invention, the hooked or looped textile may completely cover the polishing head and various tabs of less area may be applied in desired arrangements to the felt disk, and annular forms may be used which latter provides an arrangement facilitating a pumping action of the center, unconnected portion of the felt pad.

The above, other objects and novel features of the invention will become apparent from the following specification and accompanying drawings which are merely exemplary.

In the drawings:
FIG. 1 is a perspective view of a glass polishing head and pad to which the principles of the invention have been applied;
FIG. 2 is a perspective view of a glass polishing head and pad to which the attaching means of the present invention has been applied but of a form different from that shown in FIG. 1;
FIG. 3 shows another modified arrangement of the means for attaching the pad to the glass polishing head; and
FIG. 4 is an enlarged sectional view of the attaching means of the present invention.

Referring to the drawings, and particularly to FIG. 1, the principles of the invention are shown as applied to a glass polishing head including a metal disk 10 having a centrally disposed spindle or stem 11 extending therefrom. The stem 11 is adapted to be connected to a rotatable driving member of the glass polishing machine that is reciprocated in a direction axially of the stem 11 to raise and lower the polishing head with a felt attached thereto and onto a glass plate being polished.

A sheet of woven textile 12 may be attached to the face of the polishing head 10 by any suitable means. Preferably, the woven textile sheet 12 is provided with a precoat on its back face which is adapted to be activated by a solvent such as methyl ethyl ketone.

Referring to FIG. 4, the sheet 12 may include hooked elements 13 extending at substantially right angles to sheet 12. The elements 13 may be of flexible resilient material of any sort capable of accomplishing the desired results.
The only critical characteristic is that the hook should be sufficiently flexible to permit its flexure for a purpose to be described later. Although the hooked elements 13 may be of any suitable material, a sheet material known by the trade name "Velcro" has been found to be satisfactory. This material is shown, described and claimed in U.S. Patent 3,009,235. It utilizes plastic such as nylon as the thread that forms the hooked elements 13, or any other thread material that can be heat set. However, the hooked elements 13 may even be made from a flexible wire suitably penetrating a bucking sheet and firmly secured therein. There are a great number of the hooked elements 13 per square inch of the sheet material. The back of the sheet 12 may be provided with a solvent activated precoat for purposes of forming an adhesive for securing the sheet 12 to the front face of the polishing head 10. A precoat that is activated by methyl ethyl ketone has been found to securely hold the sheet 12 to the metal face of the polishing head 10.

A felt polishing pad 14 of usual construction may have a textile sheet 15 applied to its one face. The textile sheet 15 may include a profusion of loops 16 extending upwardly from the sheet. There may be hundreds of such loops per square inch and they are usually substantially softer or less rigid than the hooked elements 13.

The sheet 15 may be attached to the pad 14 by stitching, stapling or by an adhesive such as the solvent activated precoat employed with the sheet 12.

The construction is such that aligning the pad 14 with the head 10 and firmly pressing them together causes the hundreds of hook elements 13 per square inch to engage hundreds of loops 16 per square inch, so that a firm, mechanically interlocked bond is formed between the sheets 12 and 15 and consequently the pad 14 is firmly attached to the head 10. Since the mechanically interlocked connecting means is particularly strong in torque resistance, it is especially suited for use in attaching felts to a polishing head.

When the felt pad 14 becomes worn, it is only necessary to pry it off the head 10 by a peeling action, the connecting means having its minimum resistance to separation by peeling.

In the embodiment shown in FIG. 2, the sheets 12 and 15 are annular in form, providing a central unattached portion of the felt pad 14. This arrangement acts to provide a pumping action of the felt pad 14 as the head 10 is raised off and lowered onto the glass being polished. Such action may be of assistance in removing lumps of material or in removing and preventing the entanglement therein of the material being polished.

In the embodiment shown in FIG. 3, the connector sheet 12 is substantially the same as that of FIG. 1, whereas inwardly extending strips 17 are applied to the one face of the pad 14, and patches 18 are applied between the segments of the pad 14 formed between the strips 17. This arrangement reduces the area of felt pad requiring connecting means.

If desired, a layer of canvas could be put on the felt pad by adhesive and one of the base material or sheet means fastened thereto by an adhesive, such then being joinable to the head base material.

Still further, one of the base sheets could be fastened to a sheet of canvas and the canvas fastened to the material polishing head by a circular band (not shown), the other base sheet means on the felt pad then being joinable to the head base sheet as described previously.

Although the various features of the improved polishing head and pad have been shown and described in detail to 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. A polishing head for glass polishing machines comprising in combination, a flat disk having a spindle attached to one face thereof, a felt polishing pad having substantially the same area as that of said disk, circular ring shaped sheet means conforming to and adhesively secured to each of said disk and pad, said sheet means having a multiplicity of closely spaced interengageable hooking elements thereon, the hooking elements on one of said sheet means being of flexible resilient material having hooks at the ends thereof and the hooking elements on the other sheet means being in the form of loops, each of said sheet means being open and unattached in the center thereof whereby when said opposing surfaces of said sheet means are pressed together the hooking elements and loops are interengaged and the unattached portion of said pad may move relative to said sheet means and disk to provide a pumping action of the felt when the head is raised and lowered on the glass being polished.

2. A polishing head for glass polishing machines comprising in combination, a flat disk having a spindle attached to one face thereof, a felt polishing pad having substantially the same area as that of said disk, disk sheet means conforming to and adhesively secured to said disk, and a series of radially extending opposed strips and patches angularly arranged thereinbetween and also in opposed relation, said strips and patches being adhesively secured to said felt pad, said disk sheet means and said strips and patches having a multiplicity of closely spaced interengageable hooking elements thereon, said hooking elements having hooks and loops on the ends thereof whereby when said disk and pad are pressed together the hooking elements and loops therebetwen are interengaged.

References Cited

UNITED STATES PATENTS

2,286,208 6/1942 Kirchner
2,544,940 3/1951 Ritterbusch et al.
2,717,437 9/1955 Mestral
2,976,914 3/1961 Miller
3,127,259 3/1964 Boylan
3,143,895 8/1964 Robie.

FOREIGN PATENTS

80,153 2/1963 France.

CHARLES A. WILLMUTH, Primary Examiner.

50

DANIEL BLUM, Examiner.