Nov. 29, 1949 J. R. REICH 2,489,722

CENTER LAP

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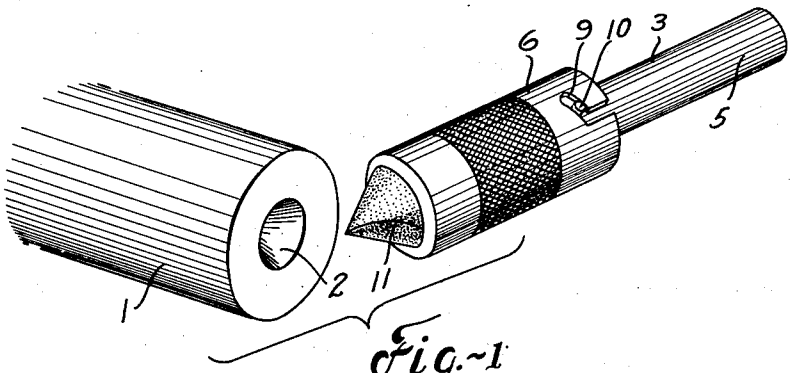

Fig.-1

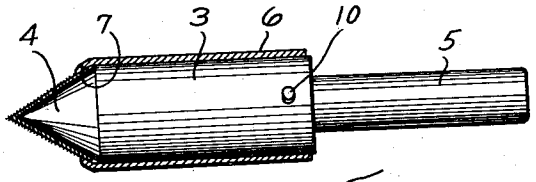

Fig.-2

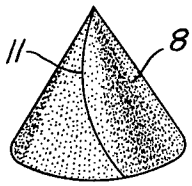

Fig.-3

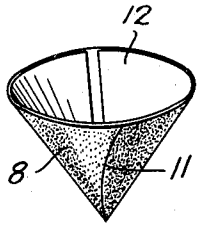

Fig.-4

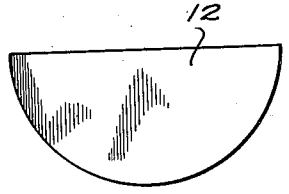

Fig.-6

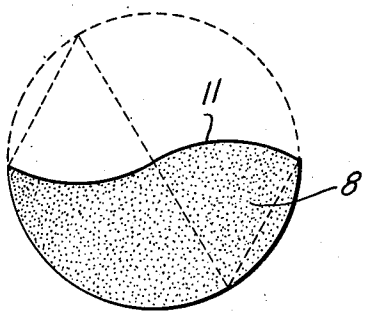

Fig.-5

Inventor

Julius R. Reich

By F. L. Walker

Attorney

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CENTER LAP

Julius R. Reich, Dayton, Ohio

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8 Claims. (Cl. 51—185)

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This invention pertains to abrading tools and more particularly to a lathe center lap having a replaceable abradant surface stratum. In machine operations upon work pieces having therein preformed lathe centers or conical depressions usually of sixty degrees contour, such conformations become coated with foreign material, rust or dirt deposits which destroys the accuracy with which such parts may be mounted for further machining operations. The deposit of scale within the conical centers of parts which may have been heat treated is especially prevalent. The present abrasive center lap is especially designed for removing such deposits and for reducing the conical center depressions to accurate form and polishing the interior surfaces thereof. Heretofore abrasive wheels or stones which require more or less frequent dressing or roughing have been employed for this purpose. Repeated dressing thereof eventually changes the shape and size of such permanent laps.

To enable successive centers to be uniformly surfaced it is desirable to use a fresh abrasive surface for each operation. In the present instance provision is made for quickly engaging with a holder and releasing interchangeable abrasive coated cones which conform to the angularity of the center depressions of the work pieces.

The object of the invention is to improve the construction as well as the means and mode of operation of abrasive center laps whereby they may not only be economically manufactured, but will be more efficient in use, rapid and accurate in operation, uniform in action, and unlikely to get out of repair.

A further object of the invention is to provide interchangeable abrasive cones which conform to the conical center depressions to be cleaned.

A further object is to provide an improved reinforced construction of the abrasive cones, and to provide an unaligned seam to insure smoothness of operation and prevent injury of the cone.

A further object of the invention is to provide an improved holder or mount with which the abrasive cones may be easily and quickly engaged and disengaged.

A further object of the invention is to enable the use of a fresh abrasive surface for each operation and to obviate the necessity of dressing the abradant surface and hence assure maintenance of accurate size and shape thereof.

A further object of the invention is to provide an abradant center lap having the advantageous structural features, the inherent meritorious

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characteristics and mode of operation herein set forth, or their equivalents.

With the above primary and other incidental objects in view as will more fully appear in the specifications, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described or illustrated in the accompanying drawings.

Referring to the drawings wherein is shown the preferred, but not necessarily the only form of embodiment of the invention,

Fig. 1 is a perspective view of an assembled center lap embodying the present invention together with a portion of a work piece having therein a conical center depression to be cleaned.

Fig. 2 is a side elevation, partly in section of the center lap shown in Fig. 1.

Figs. 3 and 4 are reverse perspective views of an abrasive cone removed from its holder.

Fig. 5 is a plan view, somewhat diagrammatic, of the abrasive cone blank before formation.

Fig. 6 is a plan view of a blank for the cone reinforcement liner.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, 1 is a portion of a work piece having in the end thereof a preformed conical lathe center depression 2 which the present center lap is adapted to clean and polish.

The center lap, forming the subject matter hereof, shown in Figs. 1 and 2, comprises a cylindrical body portion 3 reduced at one end to a conical terminal 4 of shape and size to fit the center depression 2. The terminal 4 is preferably of approximately sixty degrees angularity, which is the established standard. At its opposite end the body 3 is provided with an axial shank or stem 5 engageable in any lathe or drill press chuck, or in a lathe tail stock. It may be used in a hand drill or a brace. Slidingly mounted on the cylindrical body 3 is a clamp sleeve 6, one end of which is angularly flanged internally at 7 to agree with the tapered terminal 4.

Interchangeably engageable over the conical terminal 4 are a series of abrasive coated caps or cones 8—8. The cones or caps 8 are formed from abrasive coated sheet material, and are wrapped and pressed over a corresponding form or mold. They have an altitude sufficient that when positioned over the conical terminal 4 of the holder, the base margin of the cone will be overlapped and clamped by the inclined flange 7 of the sleeve 6 upon partial rotation of the latter.

The sleeve 6 is provided at its opposite end with a bayonet slot 9, the transverse arm of which is slightly inclined to afford camming engagement with a stud 10 projecting from the main body 3 by which the flange 7 is caused to grip the margin of the cone under pressure. The cone 8 after use is easily and quickly disengaged by a reverse partial rotation of the sleeve 6.

The blank from which the abrasive cap or cone 8 is formed comprises a segment of one hundred and eighty degrees. The transverse margin thereof is of undulating form, as shown in Fig. 5. The radii of the ogee marginal curve of the blank is equal to the radius of the segmental arc of the blank. The ogee shape of the margin insures that the seam 11 of the finished cone is curved, which during rotation passes a given point on the work in an oblique direction, thus insuring smooth even cutting action without chatter and without injury to the cone. Interiorly attached to the cone is an adhesive semicircular liner 12 of gummed paper or the like. The liner 12 is attached in such relation that it extends across the curved seam 11, and the joint or seam of the liner 12 is positioned diametrically opposite the curved seam 11 of the abrasive cone. The abrasive and liner blanks are wrapped and formed upon a correspondingly shaped mandrel or within a mold, as a separate article of manufacture for interchangeable use with the holder. The abrasive caps or cones are preferably coated with grit of different degrees of coarseness. The 100, 120 and 150 grades of grit are most popular and preferable. The cones may be used repeatedly until the abrasive surface is exhausted before changing cones.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A center lap, including a one piece cylindrical body, a conical head at one end thereof, an axial shank at the opposite end, a sleeve slidingly surrounding the body portion, having an internal angular flange at one end overlapping the base of the conical head, and a bayonet slot in the opposite end, a stud projecting from the cylindrical surface of the body with which the bayonet slot has camming engagement, and a detachable abrasive cone enclosing the tapered head, the base margin of which is clamped beneath the angular flange of the sleeve.

2. A center lap, including a holder, an abrasive cone of sheet material interchangeable with other like cones, a curvilinear seam therein, a reinforcement liner for the abrasive material of the cone, and clamp means releasably engaging the abrasive cone with the holder.

3. A center lap, including a one piece mandrel having a conical head to receive an interchangeable abrasive conical cap conforming to the conical head, means for securing the conical cap in position fitted to the conical head, said cap comprising a semicircular segment of abrasive sheet material having an ogee transverse margin, rolled upon itself with the reverse curvilinear portions of its ogee margin in abutting relation, and an adhesive liner for the cap.

4. As an article of manufacture, a conical abrasive surfaced cap comprising a semicircular segment of abrasive sheet material having an ogee transverse margin, rolled upon itself with the reversely curved portions of the ogee margin in abutting relation, forming a curvilinear joint extending from the apex to the base of the conical cap.

5. As an article of manufacture, comprising a hollow abrasive coated conical cap having a curvilinear joint in one side of the conical cap extending from its apex to its base.

6. As an article of manufacture, a hollow conical abrasive surfaced cone, a joint in one side thereof and an adhesive liner therefor extending transversely of the interior of the joint.

7. As an article of manufacture, a hollow abrasive surfaced cone, a joint in one side thereof extending approximately from its apex to its base, and a correspondingly shaped adhesive liner for the abrasive surfaced cone positioned therein, with its joint in offset relation with that of the abrasive surfaced cone.

8. As an article of manufacture a hollow abrasive surfaced cone, a curvilinear joint in one side thereof extending approximately from the apex to the base of the abrasive cone, an adhesive liner cone within the abrasive cone, a straight joint in one side thereof disposed in offset relation with the curvilinear joint of the abrasive surfaced cone.

JULIUS R. REICH.

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