Feb. 16, 1965 A. CARACCIOLO, SR 3,169,536

ABRADER

Filed July 11, 1962

FIG. 1

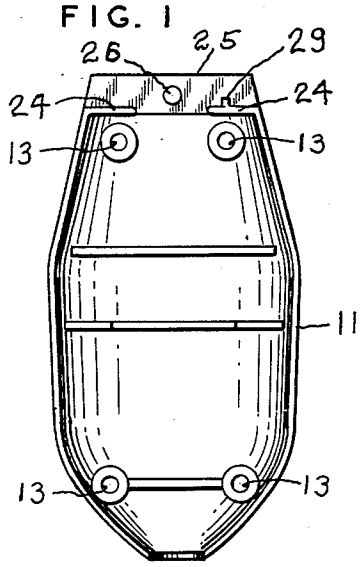



FIG. 2

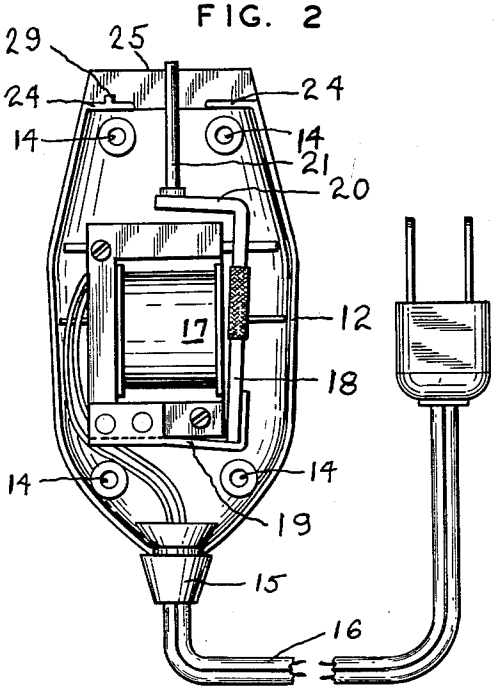



FIG. 7

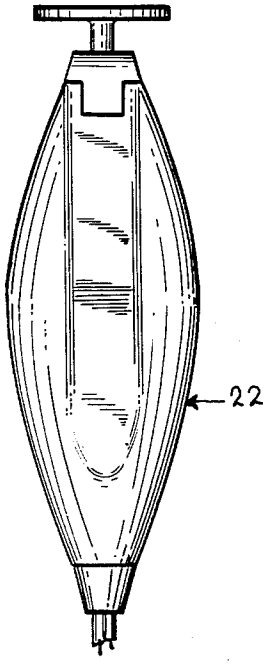



FIG. 3

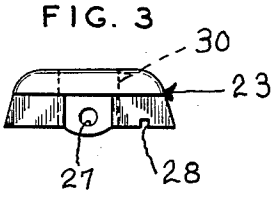



FIG. 5

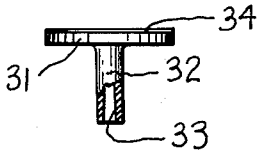



FIG. 4

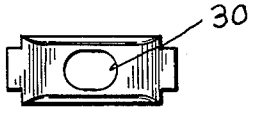
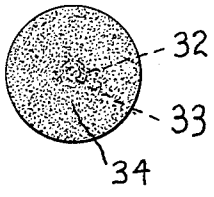



FIG. 6




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3,169,536

# ABRADER

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1 Claim. (Cl. 132—73.6)

My invention relates generally to abraders and particularly to an abrader intended for application to the human epidermis for the purpose of removing thickened or calloused areas.

It is among the objects of my invention to provide an abrader which is useful for abrasively removing or reducing a thickened area of the human epidermis.

It is a further object of my invention to provide an abrader which will oscillate an abrasive wafer at a high rate of speed.

Yet another object of my invention is to provide an abrader which is convenient and easy to hold in the hand in order to apply an abrasive wafer connected thereto, to the human epidermis for the purpose of minimizing thickened areas thereof.

These objects and advantages as well as other objects and advantages may be attained by the device shown by way of illustration in the drawings in which:

FIGURE 1 is a vertical elevational inside view of one of a pair of shells which when assembled together form a housing for the abrader;

FIGURE 2 is a view of a shell complementary to the shell shown in FIGURE 1, with the electromagnet and armature mounted therein;

FIGURE 3 is a side elevational view of a cap cooperatively engageable by the pair of the shells, and constituting a closure for the top of the housing;

FIGURE 4 is a top plan view of the cap;

FIGURE 5 is a side elevational view of the disc, partially sectioned, for mounting an abrasive wafer, with the abrasive wafer adhesively secured thereto;

FIGURE 6 is a top plan view of the disc with the abrasive wafer applied thereto;

FIGURE 7 is a side elevational view of the assemblage.

Persistent irritation of the human epidermis in limited areas produces a natural response in the nature of a defense mechanism: This response is the formation of a callous or toughened and thickened area on the epidermis. This area is more resistant to damage by contact, than the uncalloused epidermis. The formation is commonly experienced on the hands by those who perform hard manual labor, and upon the feet by those who walk extensively, or who wear shoes that are not properly fitted. The calloused area may persist for a long period of time before sloughing off, even though it has no longer any use as a defense. The toughened thickened area may discolor and become unsightly. The application of an abrasive to the calloused area will have the effect of removing its darkened outer layer and also will have the effect of substantially reducing its thickness. The desired improved appearance of the epidermis results. The removal of callouses by scraping or cutting with a sharp implement can be dangerous unless conducted with skill and precision. On the other hand, the removal of callouses by abrasion proceeds slowly and can be conducted by the unskilled without danger. An abrader for this purpose is shown by way of illustration herein.

Referring to the drawings in detail, a pair of complementary shells 11, 12 are shown in FIGURES 1 and 2. Shell 11 is provided with four apertures 13, 13, etc. in which bolts may be inserted to secure the shell 11 to the complementary shell 12. The shell 12 has four cooperative threaded tubular enlargements 14, 14, etc. by which the shell 11 can be bolted to the shell 12. The bottom of the shells 11, 12 are provided with semi-circular openings in which a cord guide 15 can be seated. A cord 16



can be introduced through the cord guide 15 into the housing formed by the shells 11, 12. Mounted in the housing is an electromagnet 17. A resilient deflectable armature 18 is mounted on a bracket 19 so that the armature 18 will be responsive to the electromagnetic lines of force originating in the magnet 17. This deflectable armature has a top, L-shaped portion 20, which extends transversely in the shells 11, 12 near the cap 23. The bent over portion 20 is provided with a rigidly attached stem 21. This stem extends out of the housing 22.

The housing is enclosed at its upper end by a cap 23. The shells, 11, 12 have inwardly extending walls 24 near their top edges 25. These walls 24, 24 do not meet, but have a gap permitting the protrusion of the stem 21 from out of the housing. The upstanding portions 25 of the shells 11, 12 above the walls 24, 24, are provided with a small domed enlargement 26. This enlargement engages an aperture 27 in the cap 23, when the shells 11, 12 are assembled together with the cap between the portions 25. The cap 23 is provided with a transverse slot 28. The walls 24 on each of the shells 11, 12 have an upstanding rib 29 that enters the slot 28 in the cap 23. Thus, when the shells 11, 12 are bolted together, the cap 23 is firmly secured in place. The cap 23 is provided with a generally oval, elongated, top slot 30, through which the stem 21 extends. Mounted on the stem is a disc 31. The disc 31 has a socket enlargement 32 having an interior bore 33. The bore 33 is press-fitted onto the stem 21. Adhesively secured to the top of the disc 31, an abrasive wafer 34 is attached. Since the armature is magnetically deflectable with respect to the magnet 17, when the magnet is energized by an alternating current, the armature 18 will oscillate at a high rate of speed and the abrasive wafer 34 will be caused to describe a reciprocating movement. When the wafer 34 is applied to the human epidermis while it is reciprocating, a callous to which it is applied will be abraded and reduced in size. The housing 22 is generally ovoid, so that it is convenient to hold in the hand in order to apply the wafer 34. The manipulation of the device is simple; it painlessly and rapidly accomplishes its object of thinning callouses of the epidermis without harming the normal underlying skin.

The foregoing description is merely intended to illustrate an embodiment of the invention. The component parts have been shown and described. They each may have substitutes which may perform a substantially similar function; such substitutes may be known as proper substitutes for the said components and may have actually been known or invented before the present invention; these substitutes are contemplated as being within the scope of the appended claim, although they are not specifically catalogued herein.

I claim:

An abrader comprising

(*a*) a pair of complementary shells defining a housing having an internal cavity and an opening in at least one end thereof,

(*b*) an electromagnet seated within the cavity in the housing,

(*c*) an electro-magnetically, deflectable armature mounted in cooperative relation to the electromagnet,

(*d*) an upstanding wall on each shell at the said opening in the housing, the walls being generally parallel to each other and separated to define a slot,

(*e*) a pair of coplanar walls on the shells generally perpendicular to and positioned between the upstanding walls, the coplanar walls extending inwardly toward each other to define a platform beneath the top of the upstanding walls, the ends of the coplanar

walls being separated to define an opening communicating with the cavity in the housing.

(*f*) a cap seated on the coplanar walls between the upstanding walls, the cap having a transverse opening communicating with the opening defined by the coplanar walls,

(*g*) an upstanding rib on one of the coplanar walls extending generally perpendicular to the upstanding walls,

(*h*) a complementary groove on the bottom of the cap receiving the rib,

(*i*) a domed enlargement on each upstanding wall extending into the slot,

(*j*) a complementary aperture on each side of the cap receiving one of the enlargements,

(*k*) the armature extending from within the cavity to a point beyond the housing through the said openings,

(*l*) a disc for an abrasive wafer attached to the end of the armature outside of the housing, and

(*m*) an abrasive wafer adhesively secured to the disc.




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