

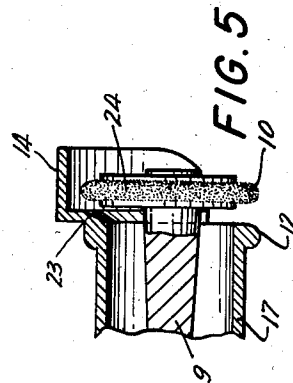
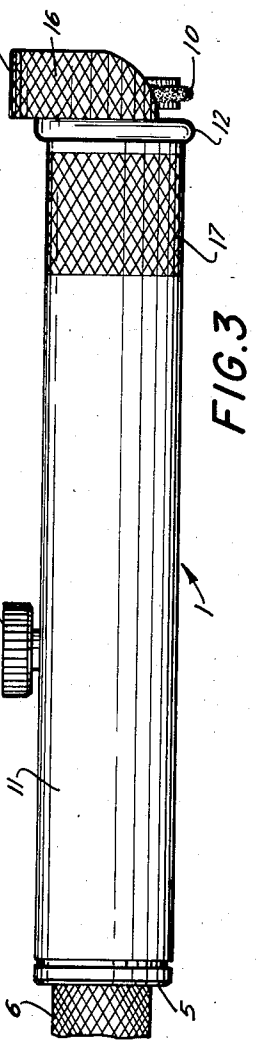
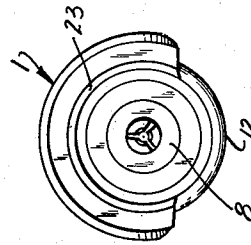
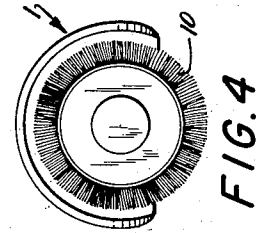
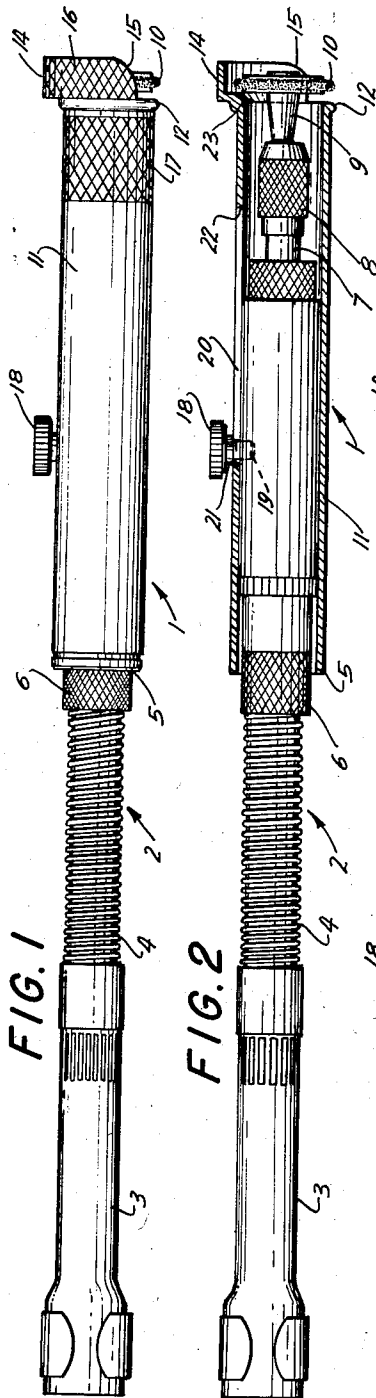
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SURGICAL HANDPIECE

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SURGICAL HANDPIECE

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4 Claims. (Cl. 128—355)

This invention relates to surgical instruments and particularly to an improved handpiece for a planing brush for dermabrasion, otherwise known as corrective surgical skin planing procedure.

The planing brush may be of the type disclosed in United States Patent No. 2,712,823 and is circular in shape. Such a planing brush is about three-quarters of an inch in diameter and is made up from one to seven layers of metallic bristles, usually of stainless steel, each layer being about three thirty-seconds inch in thickness. The bristles are radially extending and each bristle has a diameter of about three-thousandths inch. The several layers of bristles are compressed by two circular holding members and secured to a widened portion of the mandrel. The radially extending bristles project from the circumference of the holding members for a distance of about one-sixteenth of an inch and point in the direction of rotation of said mandrel at an angle of about thirty degrees. Such a planing brush, if made up of one section only, has the edge of the compressed mass of bristles trimmed so as to give it a rounded shape. The mandrel of the planing brush is locked fast to a shaft of the handpiece which is rotated by an electric motor attached to a flexible cable at speeds from 8,000 to 23,000 revolutions per minute.

The purpose of the rotating planing brush is to produce a leveling and macerating effect upon skin scarred by a disease or upon a blemish marking the skin. In using the planing brush, the treated skin is either injected with anesthetic liquid or preferably frozen by spraying a low boiling point volatile liquid thereon, the preferred liquid being ethyl chloride or a Freon derivative or a mixture of both. The treated skin area while remaining in frozen state is insensitive to pain, immobile and hemostatic.

The abrasion is produced by the shearing force of the bristles of the rotating brush at its high speed of rotation as it is held in the handpiece by a physician and brought down vertically to make a contact upon the frozen area of the scar or blemish. The brush is then moved in short strokes up and down or with a circular motion until the entire frozen area is abraded to a required depth. In such a technique a thin layer of the top of the skin, called epidermis, is removed. Such a technique of abrasion or surgical planing is carried down through the epidermis, which is the superficial layer of the skin, to the varying levels of the dermis depending on the depth of the scar. However, such an abrasion should not extend beyond the germinative zone of the corium in order to obtain regeneration of epithelium without scarring. Since the thickness of epidermis and its layers of the entire skin ranges from 2 to 2.2 mm., a surgeon must control the instrument with great care lest he will abrade deeper beyond the upper layer of corium and cause hypertrophic scarring, which is a permanent disfiguration and related in its nature to a keloid. On the other hand, if the abrasion is not sufficiently deep, the macerating effect upon the pilosebaceous cells of the germinative zone will

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be insignificant and no regeneration of the epithelial cells will take place and no therapy of the scar would result. Thus, a repetition of the abrasive procedure will be necessary. A further difficulty in the technique of abrasion is presented by a limited time during which the treated area, usually not over nine square inches, remains frozen, thus requiring the surgeon to operate rapidly which, of course, is strenuous and fatiguing. Furthermore, the operative procedure requires that the planing brush be moved across the skin in a direction at right angles to the plane of the brush.

This is important as motion in the line of rotation may result in grooving and permanent scarring of the skin. In this technique it is important to have a firm grip on the handpiece while the abrasive process is being performed, since there is a tendency for the brush to pull in the direction of rotation of the brush. If the surgeon is careless or inexperienced, it is possible to lose control of the brush which will gouge or groove the skin beyond the area being abraded.

Another difficulty presented by the use of the instrument results from the centrifugal force that drives the abraded material in a particulate stream away from the field. This stream of epithelial particles is so heavy that it has been found necessary for the physician to wear protective clothing and a transparent face protection.

The present invention aims to overcome the foregoing difficulties by providing an improved handpiece for a planing brush in which means are provided for supporting the planing brush in relationship to the skin surface.

Another object of the invention is to provide an improved handpiece which is simple and economical in manufacture, efficient in operation, and rugged in use.

In accordance with the invention, this is accomplished by providing a guiding surface or rest for the planing brush in close proximity thereto and of semi-annular shape of approximately the same or slightly larger radius than the radius of the planing brush.

The present construction is advantageous in that it permits safer working to the nostrils or eyes and gives great stability of manipulation. Additionally, a long moment arm is provided for the handle and a short moment arm for the planing brush. Therefore, a comparatively large movement of the handle is required to produce a small variation in the depth of abrasion. The surgeon is thus able to rapidly manipulate the instrument while it is in contact with the skin surface rather than making the short overlapping strokes required by use of the prior devices.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings which show by way of example an embodiment of the invention.

In the drawings:

Figure 1 is a side view of a handpiece in accordance with the invention and showing a portion of a flexible power cable.

Figure 2 is a view corresponding to Figure 1 with the handpiece shown in vertical section.

Figure 3 is an enlarged view of the handpiece.

Figure 4 is an end view of the handpiece.

Figure 5 is an enlarged portion of the end of the handpiece.

Figure 6 is an end view corresponding to Figure 4, but with the planing brush removed.

Referring to the drawings, there is shown in Figure 1 a handpiece 1 in accordance with the invention attached to a conventional flexible cable power supply 2.

The flexible cable power supply 2 includes a coupling member 3 adapted to be attached to any suitable cable power supply and which may be of the type used by

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dentists or for other surgical apparatus. An extremely flexible portion 4 of conventional design is provided for easier manipulation of the handpiece 1.

As may be seen more clearly in the cross-sectional portion of Figure 2, the handpiece 1 is made in tubular section with an open end 5 adapted to overlie a bushing member 6 terminating the flexible portion 4 of the power cable. The bushing member 6 extends inwardly within the tubular handpiece 1 and has extending therefrom a shaft 7 and a chuck member 8 to receive a shank 9 of a rotary planing brush 10. So far the construction is conventional.

In accordance with the invention, the handpiece 1 is provided with a sleeve 11 which extends towards the planing brush 10, terminating in a generally annular guiding member or rest 12 providing a surface for the support of the handpiece adjacent the operative field.

The guiding member 12 in cross-sectional view is rounded or may be made of any suitable cross-sectional shape providing ease of motion over the skin surface. Preferably the width of the guiding member 12 is approximately $\frac{3}{32}$ of an inch. The diameter of the guiding member 12 is chosen so that it is equal to or preferably 1 to 4 millimeters larger than the diameter of the rotary planing brush 10. As shown, the guiding member 12 is made circular and extends completely around the tubular handpiece 1; however, as will later appear, the guiding member 12 may be only segmental in shape. At the outer end of the sleeve 11 is an extension or shield 14 which overlies the rotary planing brush 10 extending outwardly as may be seen from the drawing slightly past the outermost edge of the planing brush so that the stream of abraded skin material is prevented from being thrown outwardly by centrifugal action into the face of the surgeon. The diameter of the extension or shield 14 is such as to provide about $\frac{1}{8}$ of an inch clearance beyond the edge of the rotary planing brush 10.

The extension 14 extends annularly about the rotary brush 10 slightly more than around one-half the circumference thereof. The outward corner of the extension is curved as indicated at 15 to enhance the appearance thereof and to prevent the formation of a corner. Furthermore, the curved surface 15 provides a support or rest in addition to that provided by the guiding member 12 which may be used effectively as desired by the surgeon. The outer surface of the extension or shield 14 is knurled or otherwise machined as indicated at 16, and also the outer surface of the tubular member 1 is knurled as indicated at the end thereof at 17 to provide a better grasp for the fingers of the surgeon.

In order to provide access to the chuck 8 for the replacement of the planing brush 10 and for its adjustment with respect to the guiding member 12, an adjustment screw 18 is provided engaging in a threaded recess 19 in the bushing 6. As indicated at 20, a longitudinally extending slot 20 is provided axially of the sleeve 11 with the ends of the slot indicated at 21 and 22. By means of the slot 20, it is readily apparent that the sleeve 11

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may be moved within the limits of the slot 20 back over the flexible portion 4 so as to expose the chuck 8 and the planing brush 10. Additionally, when the sleeve 11 is moved outwardly over the planing brush 10, any suitable desired adjustment may be made longitudinally with respect to the planing brush 10 of the guiding member 12. It should be noted that in the inner side of the extension 14 there is formed a tapered shoulder 23 against which may abut a side member 24 of the planing brush 10. However, it is preferable that there be no contact, but that the members operate in close juxtaposition to each other.

While the invention described and illustrated with reference to a specific embodiment thereof, it will be understood that other embodiments may be resorted to without departing from the invention. Therefore, the form of the invention set out above should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. An improved handpiece for a rotary skin planing brush for abrading skin deformities comprising a tubular handle member adapted to receive a rotary planing brush at one end thereof, and an annular rest secured to an end of the handle member inwardly of the rotary brush, the diameter of the annular rest at least as great as the diameter of the rotary planing brush with which it is to be used, the cross-sectional shape of the annular rest generally rounded on its outer surface, the plane of the annular rest parallel to the plane of the rotary planing brush, whereby by pivoting the annular rest on a skin surface the contact of the rotary planing brush therewith may be varied so that a desired predetermined depth of cut may be produced.

2. An improved handpiece for a rotary skin planing brush according to claim 1 in which the diameter of the annular rest is between 1 and 4 millimeters greater than the diameter of the rotary planing brush with which it is to be used.

3. An improved handpiece for a rotary skin planing brush according to claim 1 and including a shield for the rotary planing brush, the shield overlying the rotary planing brush the circumference at least one-half the periphery thereof.

4. An improved handpiece for a rotary skin planing brush, according to claim 1 in which the width of the rounded surface of the annular rest is approximately $\frac{3}{32}$ of an inch.

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