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D. H. OSBORNE

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APPARATUS FOR FINISHING INSULATOR SHELLS

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INVENTOR

David H. Osborne

BY

ATTORNEYS.
My invention relates to apparatus for finishing insulator shells or nonconducting members and more particularly for grooving or otherwise recessing the walls of the recesses in such shells.

As is well known insulators, such as are used in connection with the support of high tension electric transmission lines, include a shell or nonconducting member, usually of porcelain assembled with members usually of metal for connection to a support and to a wire or cable respectively. It is also usual to assemble two or more nonconducting members or shells together to obtain additional insulation between the members connected to the support and to the wire or cable. The assembled members, including the shell or nonconducting members, are usually secured in assembled relation by means of cement, as Portland cement.

The shell or nonconducting member of an insulator is formed, by molding, with an apron portion from which depend skirts and with a head portion for engagement with a cap member. The head portion is provided with a recess from its bottom, or an extra long skirt is provided beneath the apron to form a recess, for the reception of the head of another shell or nonconducting member, or of a member, as a pin, for connecting with a wire or cable. The cement utilized to secure the members of the insulator together is filled in between the head of the shell and cap member and about the head, or pin, in the recess formed in the shell. While the cement may be bonded to the material of the shell, or nonconducting member, of porcelain, if the surface be unglazed, and while it has been known to provide specially prepared surfaces on the shell or non-conducting member in order to increase the bond of the cement, it is desirable to groove, thread or otherwise recess the surface of the head and interior of the recess in the shell in order to permit the cement to key to the head and within the recess.

The grooving, threading, or otherwise recessing of the surface of the head is a relatively simple matter, such being accomplished when the molded shell or non-conducting member is relatively soft or green, but the similar operation in the recess in the shell, whether formed as a recess in the head, or by a depending skirt, presents a problem of more difficulty and heretofore no entirely satisfactory means has been provided for performing the operation in an expeditious and efficient manner and without injury to the shell.

Now it is the object of my invention to provide an apparatus for grooving, threading, or otherwise recessing the surface of the said recess in an insulator shell with a maximum of efficiency and in a minimum of time and at the same time without injury to the shell as a whole, or any portion thereof.

Further, to produce an apparatus which will enable the desired operation to be performed while the shell is in the mold in which it is formed and while it is in the most desirable stage for cutting.

Having now indicated in a general way the nature and purpose of my invention, I will now proceed to a detailed description of my invention with reference to the accompanying drawings in which is illustrated a preferred embodiment thereof and in which:

Figure 1 is a view mainly in section and partly broken away of an apparatus embodying my invention.

Figure 2 is a view partly in section of a cutting tool and support therefor.

Figure 3 is a sectional view on line 3-3, Figure 2.

The apparatus, in accordance with my invention, may be mounted in relation to a table or bench a, supported on legs b and having sides c. Centrally of the table a there is provided a journal or bearing d through which extends one end of a vertical shaft e, the lower end of which is supported in a suitable bearing. The shaft e is provided with a pulley f for the reception of a belt driven from a suitable source of power and by means of which the shaft e may be rotated. On the upper end of the shaft e, above the level of the table a, is mounted a support g for supporting a member h which is adapted to receive an insulator shell. The member h may, if desired, be the mold in which the shell is formed. The insulator shell shown
in Figure 1, as supported by the member \( h \), comprises a head portion \( i \), an apron \( j \) and skirts \( k \) and \( l \). The skirt \( l \) is of such a length as to form a recess \( m \) of substantial depth.

Supported from the table \( a \) by a frame work \( n \), is a tool support \( o \). The tool support is supported substantially in line with the shaft \( e \) and in such a manner as to be vertically movable. The tool support is preferably hollow being connected at its upper end to a hose or tube \( p \) in turn connected to a source of compressed air. The support is made in two sections threaded into a valve casing \( q \) which casing serves to connect the sections, and the valve in which casing serves to control the passage of compressed air through the support. A circular foot, or disc \( r \), the edges of which are rounded up, is rotatably secured to the lower end of the support. The lower end of the support is closed by the disc \( r \) and lateral openings \( s \) are provided adjacent the lower end for the passage of compressed air.

Secured to the support adjacent its lower end, as by means of set screws, are a pair of spaced brackets \( t \), at the free ends of which is journalled a rotatable post \( v \), from which, adjacent its upper end, extends a handle \( w \) and to which, adjacent its lower end, is adjustably secured a cutting tool \( z \). The tool \( z \) as illustrated, comprises a ribbon-like blade \( w \) formed for cutting grooves such as are shown at \( a \), Figure 1.

In operation, assuming that the tool \( w \) has been adjusted relative to the post \( v \), for the size of the recess in the shell, and that the several elements of the apparatus are in the position shown in Figure 1, the shaft \( e \) is rotated by the application of suitable power through pulley \( e \), which causes the shell to be rotated. The tool \( w \) is turned by turning post \( v \) in brackets \( t \), through the medium of handle \( w \), so as to extend mainly within the confines of the disc \( r \), or so that its edge is a less distance from the center of the support \( o \) than the length of the radius of the recess \( m \), as indicated in Figure 3. Since the support \( o \) is in line with shaft \( e \) with which the supported shell is centralized, and since the recess \( m \), as is customary, is central of the shell, the support may now be lowered to enter the tool in the recess. The support is lowered until the under surface of the disc \( r \) bears on the bottom of the recess \( m \). The disc should be brought to bear firmly on the bottom of the recess and will rotate with the rotating shell acting as a support for the end of the tool support and to center and steady the tool. The tool is now turned by turning the post \( v \), out toward the wall of the recess \( m \). As the cutting edge of the tool contacts with the wall of the recess it commences to cut the grooves \( x \) which are completed by gradually bringing the tool further and further out.

While the tool is cutting, the valve in casing \( q \) is opened and compressed air is permitted to pass through the tool support and out through apertures \( s \). The compressed air serves to blow out of the recess \( m \) the material removed by the tool. The tool may be so adjusted as to cut the grooves to the required depth on being turned fully outward, as in the position shown in Figure 3, or the depth of the grooves may be determined by the degree to which the tool is turned by the operator.

It will be understood that I do not intend that my invention shall be limited to the production of any particular effect upon the wall of the recess, since any effect as grooving, threading, undercutting, etc., may be obtained by varying the shape or form of the tool and without departing from my invention.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In apparatus of the class described, in combination, a rotatable support, a vertically movable tool support positioned in line with the axis of rotation of said rotatable support, a rotatable member carried by the tool support and adapted to be engaged with a member supported by said rotatable support, and means for leading compressed air to and discharging it at a point adjacent the upper surface of said rotatable member.

2. In apparatus of the class described, in combination, a rotatable support, a vertically movable tool support positioned in line with the axis of rotation of said rotatable support, a rotatable member carried by the tool support and adapted to be engaged with a member supported by said rotatable support, a passage extending within said tool support, a lateral outlet for said passage at a point adjacent the upper surface of said disc and means affording a supply of compressed air to said passage.

3. In apparatus of the character described, a frame, a support for an insulator shell rotatably mounted in the frame, a tool carrier guided in the frame for movement in the direction of the axis of rotation of said support, and a tool pivotally mounted on said carrier for movement about an axis parallel to the axis of rotation of said support and eccentrically disposed in relation thereto.

4. In apparatus of the character described, a frame, a support for an insulator shell rotatably mounted in the frame, a tool carrier guided in the frame for movement in the direction of the axis of rotation of said support, means on the carrier engaging within a recess in an insulator shell on the support for limiting movement of said car-
rier, and a tool pivotally mounted on said carrier for movement about an axis parallel to the axis of rotation of said support and eccentrically disposed in relation thereto.

5. In an apparatus of the character described, a frame, a support for an insulator shell rotatably mounted in the frame, a tool, and means mounting said tool in the frame whereby said tool may be moved in the direction of the axis of rotation of the support and pivots about an axis parallel to the axis of rotation of said support and eccentric thereto.

6. In an apparatus of the character described, a frame, a support for an insulator shell rotatably mounted in the frame, a tool, means mounting said tool on the frame whereby said tool may be moved in the direction of the axis of rotation of the support and pivots about an axis parallel to the axis of rotation of said support and eccentric thereto, and means limiting movement of the tool in the direction of the first mentioned axis.

In testimony of which invention, I have hereunto set my hand, at Philadelphia, Pennsylvania, on this 22nd day of December, 1926.

DAVID H. OSBORNE.