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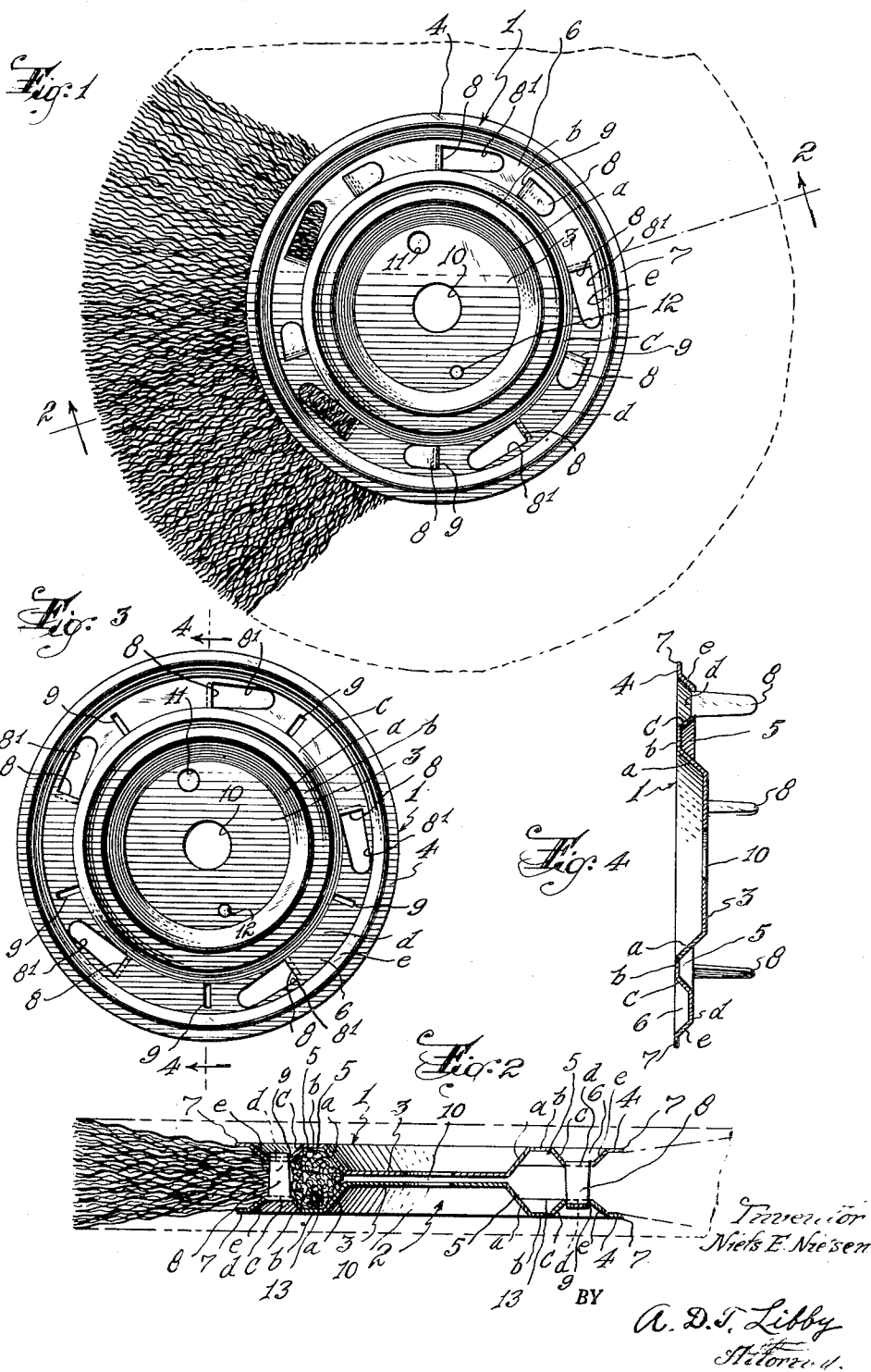
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ROTARY BRUSH

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## UNITED STATES PATENT OFFICE

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## ROTARY BRUSH

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6 Claims. (Cl. 15—181)

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This invention relates to a construction of rotary brushes made up of a large number of bristles, of suitable material adapted for use in connection with the object or material that is to be operated on by the brush.

Rotary brushes of the type to be herein described are usually operated at high speed and the bristles must therefore be held in a strong and secure manner, so that they will not be dislodged and cause trouble.

It is therefore the principal object of my present invention to find a new and improved means for holding the bristles in a permanent and secure operative position. A further object of my invention is to provide a construction in which a plurality of the brush units may be mounted on a machine arbor in close relationship so that the bristles of one brush will be associated with the bristles of the adjoining brush in such a way as to provide a continuous and what would seem like a unitary contact engaging surface of the ends of the bristles.

Other objects of my invention will be observed from the reading of the attached specification taken in connection with the annexed drawings wherein,

Figure 1 shows a plan view of one form of my construction;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is a plan view of one of the holding plates for securing the bristles in operating position;

Figure 4 is a view on the line 4—4 of Figure 3;

Figure 5 is a view similar to Figure 1 but of a somewhat different arrangement of the detailed parts of the clamping or holding plates;

Figure 6 is a view on the line 6—6 of Figure 5;

Figure 7 is a plan view of one of the holding plates used in the arrangement shown in Figure 5;

Figure 8 is a view on the line 8—8 of Figure 7;

Figure 9 is a fragmentary view of a pair of the brush units as they are to be mounted on an arbor for dual operation.

Referring now to the drawings, wherein like numbers refer to corresponding parts, 1 and 2 are two identical plates utilized for holding the bristles in operative position. Since the two plates 1 and 2 are alike, a description of one will suffice for both. The circular plate 1 has a centrally located depression 3 which terminates in an offset or raised annular rim 4 having what I term an annular internal recess 5 and an external annular recess 6. Each of these annular recesses 5 and 6

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have three sides *a*, *b*, and *c*, being common to the external recess 6, the other two sides of which are designated *d* and *e*. The side *e* preferably has a short annular extension 7 which is in the same plane as the side *b* for the purposes to be later explained. Punched inwardly from the annular side or surface *d* is a plurality of clamping fingers 8 which are preferably punched at 8' out of the surface material *d*. These fingers 8 are adapted to enter cooperative openings 9 punched in arcuately spaced relation out of the annular surface *d* as will be readily seen from Figures 1 and 2.

The depression portion 3 has a hole 10 therein for mounting the brush unit on an operative arbor. It also has holes 11 and 12 for identifying purposes in the assembly of the parts. With the construction shown in Figures 1-4 where the clamping fingers 8 and the openings 9 are spaced from each other 72 degrees, I prefer to make the hole 12 of a different diameter than the hole 11 for better identification purposes in the assembly operation.

After the bristles have been assembled as a complete continuous unit, the holding plates 1 and 2 are then applied as shown in Figure 1 and the fingers 8 on each of the plates are passed through their cooperative openings 9 and bent over into locking position as shown in Figures 1 and 2, it being understood that in the assembly operation of the plates 1 and 2 to the bristle unit, considerable pressure in the order of 3000 to 4000 lbs. per square inch is applied to the plates 1 and 2 forcing them into permanent position at which time the fingers 8 are bent over into locking position as shown in Figures 1 and 2. It should be especially noted that the inner ends of the bristles are forced into the combination recess 13 formed by the two annular recesses 5. By this construction a greater gripping power is applied to the bristles than would be dependent on the fingers 8 if the plates extended in a straight manner in alignment with the annular side *b*. Furthermore, it will be seen from Figure 2 that the locking fingers 8 are located within the exterior recess 6 below the plane of the annular surface *b* and the annular circular end 7 so that a plurality of units may be assembled in close juxtaposed position as shown in Figure 9. In addition the ends of the fingers 8 below the surface *b* are in a position so that they are not apt to be encountered by the fingers of an operator using the brush.

The construction shown in Figures 5-8 inclusive is generally the same as that described in respect to Figures 1-4 except the cooperative fingers 8 and openings 9 are spaced 60 degrees so the

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assembly holes 11 and 14 can be the same size. It will be seen that the holding plates are closer together in Figure 6 than in Figure 2. They may be even brought together so that the surfaces of the depression 3 will come in contact. It is also to be understood that these holding plates may vary in diameter in accordance with the diametrical dimensions of the brush with which they are used, and other changes and details may be varied to suit conditions.

Having thus described my invention, I claim

1. A rotary brush having a circular bristle body held in operative position by only a single pair of clamping plates, one on each side of said body, each plate having a centrally located depression with mounting means therein, the depression being surrounded by an annular raised rim spaced radially outwardly from the depression, the rim portion next to the depression having a three sided annular internal recess for receiving the inner portions of the bristle body followed by a three sided external recess, arcuately spaced cooperatively interlocking openings and fingers located in the base portions of said external recesses for locking the plates onto the bristle body, the inner portions of the bristles being located and gripped in the said internal recesses and the bristles being further gripped by the outer walls of the external recesses as described.

2. A rotary brush as set forth in claim 1 further defined in that the central part of the first mentioned three sided recess forms a circular outer flat surface substantially in a plane parallel to the plane of said depression, while the central part of the said external recess is substantially parallel to the central part of the internal recess but located a distance below the parallel surface of the internal recess so the bent over fingers in the external recess will be below the plane of the outer surface of the internal recess as and for the purpose described.

3. A rotary brush as set forth in claim 1 further defined in that the outer rim of the outer recess extends a short distance from the outer third side and in the same plane as the outer part of the central side of the internal recess and further defined in that the two recesses have a common side.

4. A rotary brush having a circular bristle body

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held in operative position by a pair of clamping plates, one on each side of said body, each plate having a centrally located depression with mounting means therein, the depression being surrounded by an annular raised rim spaced radially outwardly from the depression, the rim being divided into two radially spaced sections, the first one next to the depression forming a part of a generally circular annular internal recess for receiving the inner parts of the bristles, while the second section is an external annular recess the bottom portion of which has co-operative interlocking openings and fingers passing through the bristle body for the purposes described.

5. A rotary brush having a circular bristle body held in operative position by a single pair of clamping plates, one on each side of said body, each plate having a centrally located depression with mounting means therein, the depression being surrounded by an annular raised rim spaced radially outwardly from the depression, the rim of each plate having two radially spaced reversely formed annular recesses, the radially inner recesses of the two plates housing and gripping the inner parts of the bristle body while the radially outer recesses of the two plates have cooperative openings and fingers for fastening the plates in operative position on the bristle body.

6. A rotary brush as set forth in claim 5 further defined in that the outer recesses are such that the said fingers when in locking position are below the plane of the outer part of the radially inner recesses as and for the purpose described.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

| Number    | Name            | Date          |
|-----------|-----------------|---------------|
| 955,738   | Abrahmsohn      | Apr. 19, 1910 |
| 1,817,176 | Curtis          | Aug. 4, 1931  |
| 1,903,520 | Sturgis         | Apr. 11, 1933 |
| 2,106,610 | Kreilick et al. | Jan. 25, 1938 |
| 2,136,103 | Herold          | Nov. 8, 1938  |
| 2,525,947 | Rose            | Oct. 17, 1950 |
| 2,534,892 | Wilhide         | Dec. 19, 1950 |

##### FOREIGN PATENTS

| Number  | Country       | Date          |
|---------|---------------|---------------|
| 352,737 | Great Britain | July 16, 1931 |