

(Model.)

J. W. SMITH.

FLEXIBLE ABRASIVE AND POLISHING DISK.

No. 302,952.

Patented Aug. 5, 1884.

Fig. 2

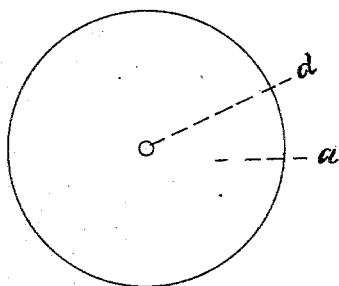


Fig. 3

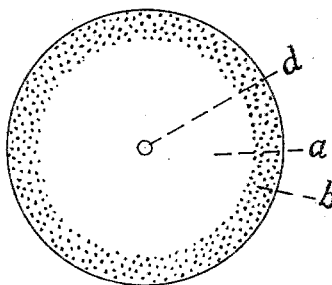


Fig. 7.

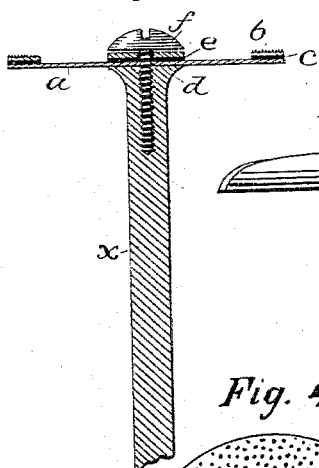


Fig. 1

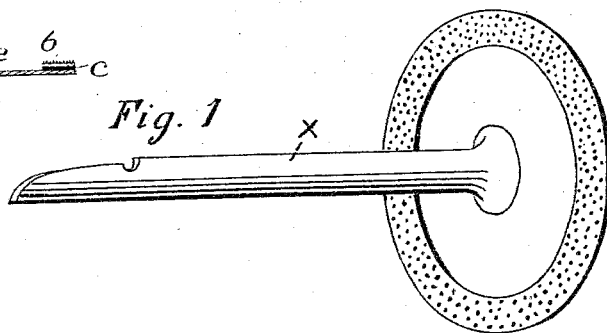


Fig. 4

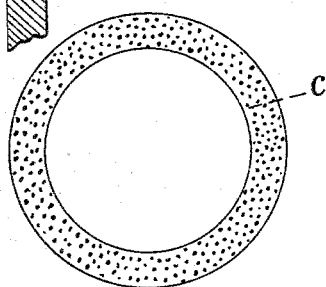


Fig. 6

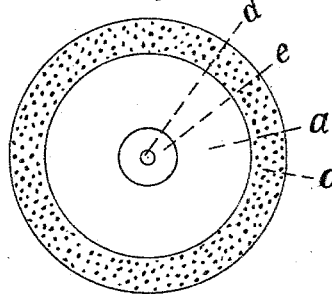


Fig. 5



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UNITED STATES PATENT OFFICE.

JOHN WILLIAM SMITH, OF NEWPORT, RHODE ISLAND.

FLEXIBLE ABRASIVE AND POLISHING DISK.

SPECIFICATION forming part of Letters Patent No. 302,952, dated August 5, 1884.

Application filed March 26, 1884. (Model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM SMITH, a citizen of the United States, residing at Newport, in the county of Newport, State of Rhode Island, have invented a new and useful Flexible Abrasive and Polishing Disk, of which the following is a specification.

My invention relates to an improved disk for the use of dentists in grinding and polishing fillings, teeth, and other objects. This improved disk is in many situations more effective than disks heretofore used for similar purposes, and its action is much more readily limited and controlled.

Reference is had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of a disk ready for use mounted on the mandrel *a*; Fig. 2, a smooth flexible disk; Fig. 3, a finished disk having the polishing substance *b* applied directly to disk *a*; Fig. 4, a flexible ring, *c*, coated on one side with a gritty substance; Fig. 5, a small disk, *e*, intended to strengthen the center of the larger disk *a*; Fig. 6, a finished disk, made by cementing small disk *e* and rim *c* onto large disk *a*. Fig. 7 shows disk and mandrel in section.

Dentists have long used strips of sand-paper and emery-paper for making fillings smooth and in performing other operations about the teeth. For a time disks cut from sand-paper or emery-paper have also been used for similar purposes. While such disks have one surface entirely covered by the gritty substance, the one I have invented has on one side a narrow abrasive and polishing rim only. This improved disk may be made by cutting a blank disk, *a*, Fig. 2, from paper or other flexible material, and, by means of glue or other suitable adhesive substance, cementing to it on one side, at, near to, and continuous with the margin, a layer of some gritty substance. Fig. 3 shows such a disk, letter *a* indicating the paper or other substance forming the body of the disk, and *b* the gritty rim. This rim may be of any desired suitable width, provided there is always between its inner edge and the outer edge of the small disk *e*, or that part of the disk covered by the clamping-face of screw

f, an annular surface not covered by gritty material. Care should be taken that the outer edge of the gritty rim reaches to or about to the margin of blank disk *a*, and that its inner edge is clearly defined, the rim being of uniform or nearly uniform width all around the disk; or, as being more conveniently made and having some additional advantages, I prefer to construct these disks as follows: First, cut from paper or other flexible substance previously coated with a suitable gritty substance, as hereinafter described, a ring, *c*, of any desired width, and, second, cement this ring to blank disk *a*, Fig. 6. The diameter of ring *c* should be about the same as that of disk *a*, and the said ring should be cemented to disk *a*, gritty side out. When the disk *a* is made of thin paper or other delicate material, the border of the screw-hole may be strengthened by making that part of double thickness. Small disk *e* serves that purpose. Disk *e* should be cemented to disk *a* in such position that its central perforation, *d*, will coincide with the corresponding hole in disk *a*. Its size should bear about the same relation to disk *a* as is indicated in Fig. 6. Generally this small disk is found unnecessary, or even undesirable. A variety of materials—among which are paper, leather, cloth, and rubber—may be used for the several parts of these disks; or any desired combination of suitable substances may be made—such as, for instance, a paper disk, *a*, a rubber small disk, *e*, and a cloth rim, *c*. Cloth may be made suitable for disks by coating with shellac varnish or other stiffening material. Paper may be improved by similar treatment. Paper for each part now has my preference. Emery-paper, sand-paper, and crocus-paper, in great variety of grades of fineness, are readily obtained, and are well adapted for use in making the ring *c* in the way hereinbefore described; but any paper or other suitable material having one or two simple gritty surfaces, or having a gritty substance permeating or forming a part of or all of its body, forming one or two gritty surfaces, of whatever suitable substances formed or by whatever process made, may be used instead of the preparations hereinbefore mentioned or provided. If the gritty substance be applied directly to disk *a*, as hereinbefore described,

any desired abrasive and polishing substance may be attached to disk *a* by any suitable means; or, instead of being entirely on the surface, the abrasive and polishing substance may be made to permeate disk *a* to any desired extent. Disks ranging in size from one-half to one inch in diameter will be found to meet all usual demands; but larger or smaller sizes may be used. By means of a screw, *f*, Fig. 7, passing through hole *d*, the disk is fastened to mandrel *x*, revolved by the dental engine. The mandrel here shown is one in common use; but these disks may be used with any other suitable rotating device. The rough surface of the moving disk wears away and polishes whatever it may be held against.

For smoothing fillings in obscure places between the teeth, in shaping contour fillings, in erasing superficial caries, and in making V-shaped spaces between the incisors, this improved disk is most useful. Only a narrow strip of the gritty surface coming in contact with the tooth or filling at one time, its work may be done more nicely and without that danger of sacrificing valuable tooth substance or filling material that attends the use of the simple sand-paper disk now so much employed. When made as shown in Fig. 6, the rim *c* contributes much to the superiority of this disk. First, it forms a raised surface that more readily reaches some obscure places; and, second, the disk *a*, Fig. 6, may be made of thinner paper than *a*, Fig. 3, and still have sufficient strength. The disk of Fig. 6 is most flexible just where that quality is most needed. The simple sand-paper disk partly supplanted the polishing-strips; but in positions where a flexible disk is most needed the one now in use utterly fails. For instance, if the cervical portion of a corono-distal contour filling in a superior bicuspid were to be polished with

the sand-paper disk now in use, not only the cervical portion, but the whole distal surface of the tooth and filling, would be made flat and the filling be no longer contoured; or if the operator try to make smooth with a common sand-paper disk a small approximate filling in an incisor having a narrow neck and broad cutting-edge, there is danger of an unnecessary sacrifice of tooth substance; or, again, in making a V-shaped space-opening palatally between the superior incisors, the cutting-edges should generally be left intact. The palatal-edge of the lateral surface should generally be made concave to near the tooth's cutting-edge. With the common sand-paper disk a space of this description cannot be made under usual circumstances.

In all cases similar to those above described, and in many others daily requiring attention, my improved disk does well and easily what the disks now in use do but indifferently or not at all.

Having fully described my invention, what I desire to claim, and secure by Letters Patent, is—

1. A disk, *a*, of paper, cloth, leather, rubber, or other flexible material, having on one side, at or near the margin, an annular surface coated with an abrasive and polishing substance, all substantially as provided.

2. A disk, *a*, of paper, cloth, leather, rubber, or other flexible material, having cemented to one side a ring of paper, cloth, leather, rubber, or other flexible material, provided with an abrasive and polishing substance, all substantially as set forth.

JOHN WILLIAM SMITH.

Witnesses:

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