Sept. 19, 1939. M. H. BISSELL 2,173,350

POLISHING AND SURFACING DEVICE

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Fig. 1.

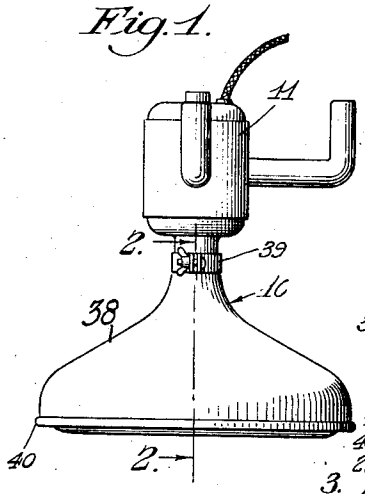


Fig. 3.

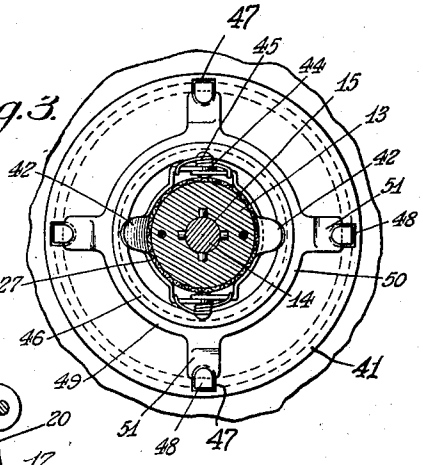


Fig. 2.

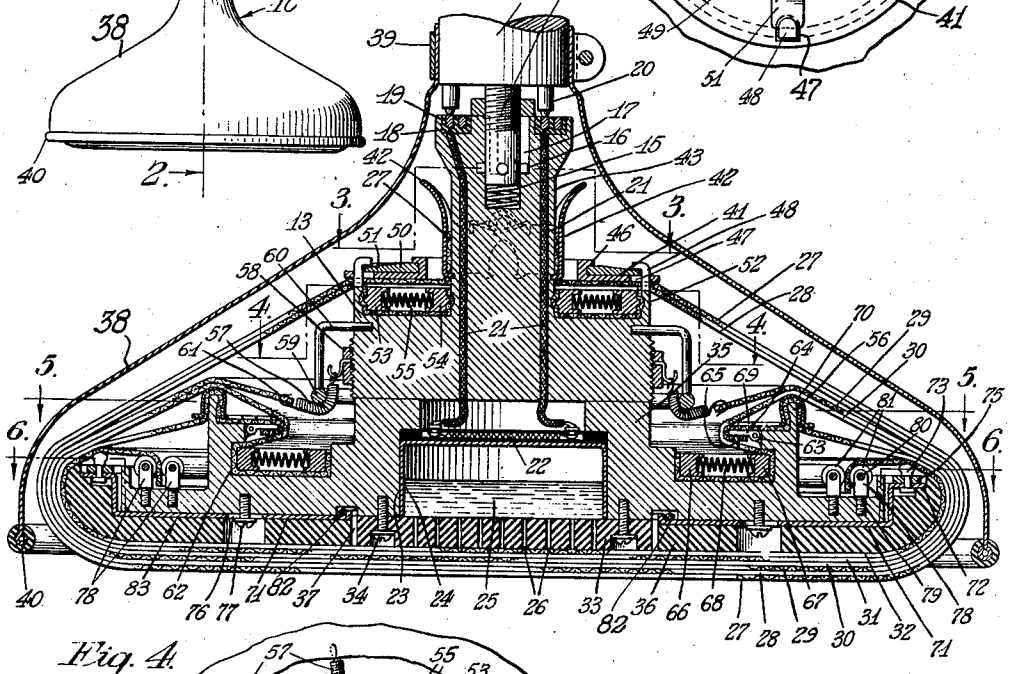
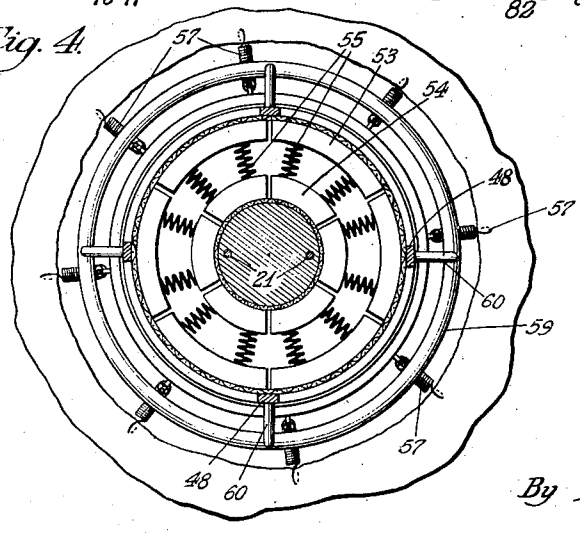


Fig. 4.



Marion H. Bissell
Inventor

By Clarence E. Threedy
His Attorney

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POLISHING AND SURFACING DEVICE

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Fig. 5.

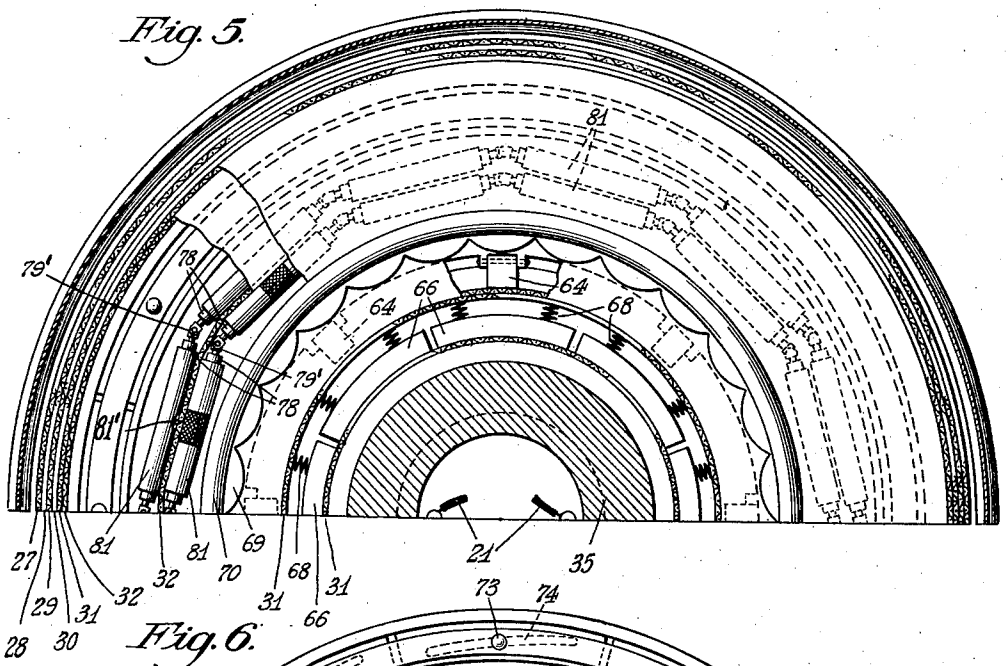


Fig. 6.

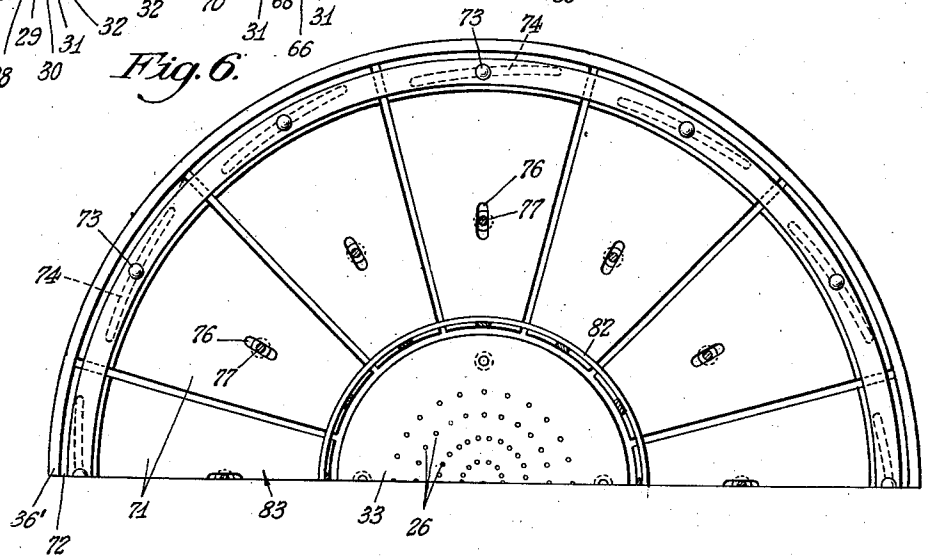
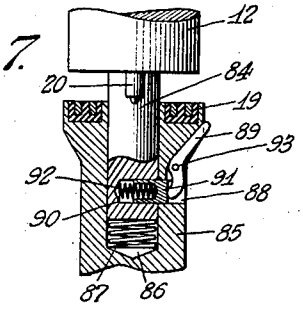


Fig. 7.



Marion H. Bissell
Inventor

By Clarence E. Threedy
His Attorney

Sept. 19, 1939. M. H. BISSELL 2,173,350

POLISHING AND SURFACING DEVICE

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Fig. 8.

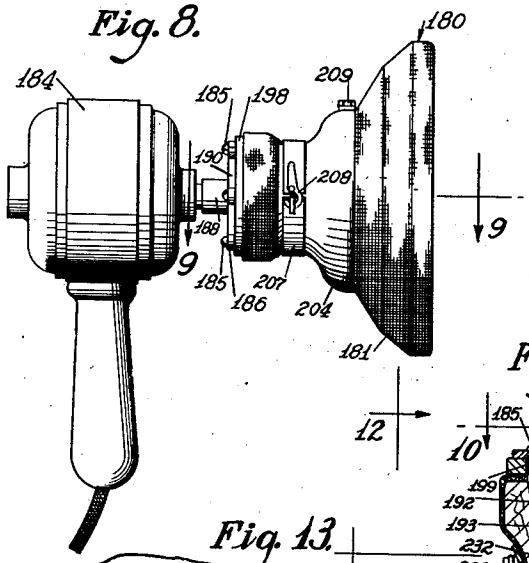


Fig. 10.

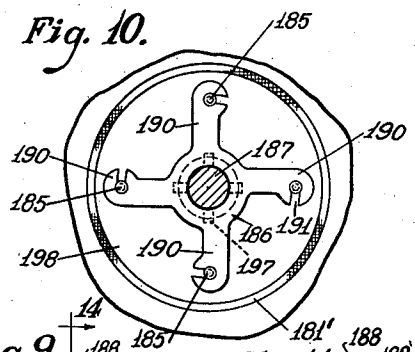


Fig. 9.

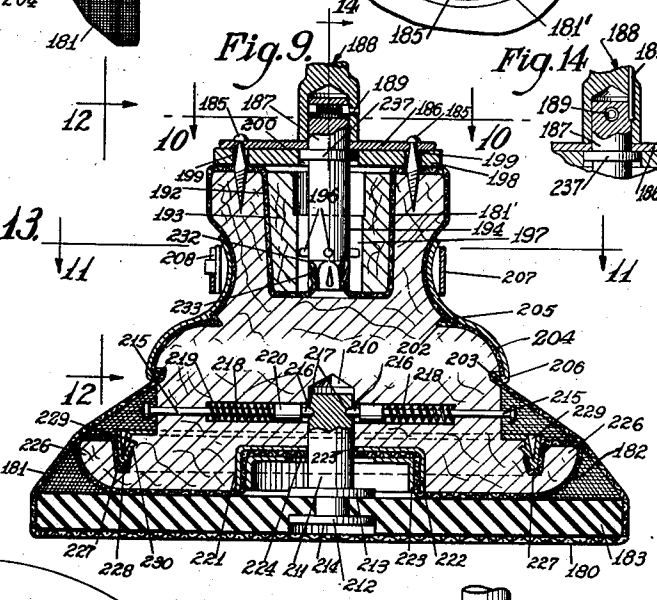


Fig. 14.

Fig. 13.

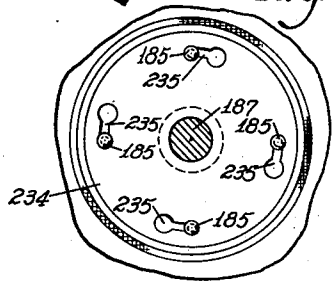


Fig. 11.

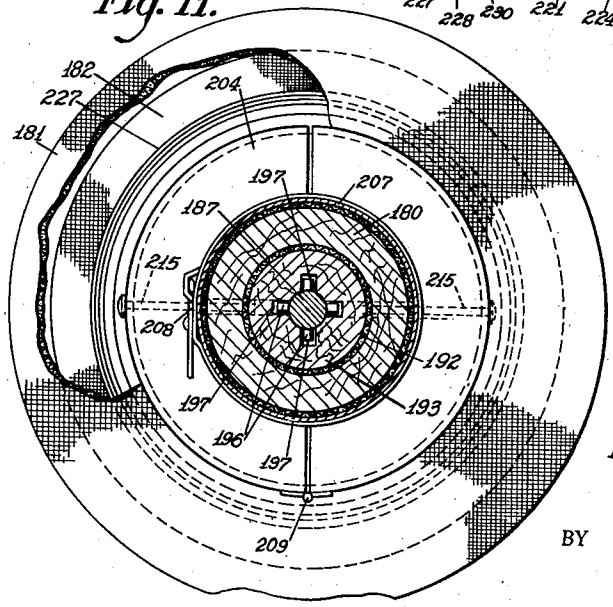
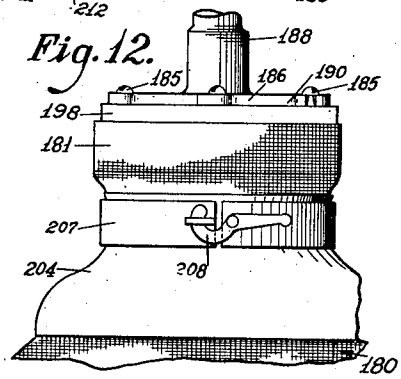


Fig. 12.



Marion H. Bissell
INVENTOR.

BY Clarence E. Threedy
HIS ATTORNEY.

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2,173,350

UNITED STATES PATENT OFFICE

2,173,350

POLISHING AND SURFACING DEVICE

Marion H. Bissell, Chicago, Ill.

Application March 1, 1937, Serial No. 128,413

19 Claims. (Cl. 91—39)

This invention relates to cleaning and polishing apparatus.

An object of this invention is to provide a cleaning and polishing apparatus, that is, a surface-treating apparatus, which includes a mounting, a plurality of folds or layers of fibrous or other flexible cleaning or polishing material such, for example, as chamois, cloth, etc., and a plurality of individual devices for separately attaching each of said layers to said mounting and for releasing the same therefrom so that as the outermost cleaning or polishing element becomes soiled and unusable during a cleaning or polishing operation it may readily be removed from the mounting by manipulating the corresponding one of said attaching devices, thus successively presenting a clean and unused cleaning or polishing element to the surface that is being cleaned or polished. By means of this device a relatively large surface area such, for example, as that of an automobile may be readily cleaned or polished.

Another object is the provision of an improved mounting or polishing head for surfacing devices.

To clean or polish a relatively large surface area, such, for example, as that of an automobile, generally requires the use of more than one fabric or like cleaning or polishing element so that before the operator completes the cleaning or polishing operation on the entire area he is forced to stop and remove the worn out or used cleaning or polishing element from its mounting and replace the same by a fresh or unused fabric or like cleaning or polishing element. This successive replacement of worn out or soiled cleaning or polishing elements results in a considerable loss of both time and labor.

Another object is to provide novel means for mounting a surface-treating member upon a holder.

A further object of the invention is to provide a novel combination of a holder, a resilient surface-treating disc or buffer arranged upon said holder, and means for attaching the buffer disc to the holder.

Yet another object is the provision of the device hereinafter described and claimed in view of the drawings in which:

Fig. 1 is a side elevational view of a preferred embodiment of the invention;

Fig. 2 is an enlarged vertical sectional view on line 2—2 in Fig. 1;

Fig. 3 is a transverse sectional view on line 3—3 in Fig. 2;

Fig. 4 is a transverse sectional view on line 4—4 in Fig. 2;

Fig. 5 is a transverse sectional view on line 5—5 in Fig. 2;

Fig. 6 is a transverse sectional view on line 6—6 in Fig. 2;

Fig. 7 is a view showing a modified form of device for removably attaching the mounting to the motor shaft;

Fig. 8 is a side elevational view of a modified form of the new apparatus ready for use;

Fig. 9 is a longitudinal sectional view on line 9—9 in Fig. 8;

Fig. 10 is a view on line 10—10 in Fig. 9, partly in section and partly in plan;

Fig. 11 is a transverse sectional view on line 11—11 in Fig. 9;

Fig. 12 is a fragmentary side elevational view on line 12—12 in Fig. 9; and

Fig. 13 is a view similar to Fig. 10 but showing a modification of a certain feature of the invention; while

Fig. 14 is an enlarged detail of the snap-on latch attachment and key-pin.

One embodiment of the invention is illustrated in the drawings and is therein generally indicated at 10. The device 10 includes a motor 11 having a shaft 14 and a housing 12 arranged about the shaft 14. The new surface-treating or cleaning and polishing apparatus also includes a sectional mounting which comprises a plurality of component parts or sections 13, 35, and 36. The section 13 may be detachably secured to the motor shaft 14 in any suitable manner, as by the device of Fig. 7, or by means of the arrangement illustrated in Fig. 2 and in which the motor shaft 14 is extended into a centrally disposed bore 15 in the mounting section 13 and radially arranged lugs 16 on the motor 14 are received in slots 17 formed in the mounting section 13.

Arranged in an annular groove 18 that is formed in the inner end portion of the mounting section 13 are electrically conductive contact rings 19 and engageable with these contact rings 19 are terminal contacts 20 that are carried by the motor shaft 14. Leading from the contact rings 19 centrally through the mounting section 13 and 35 are conductors 21 which are electrically connected, within the mounting section 35, to a heating element 22. Formed in the mounting section 35 is a recess 23 in which is embedded a cup-shaped receptacle or well 24. This member 24 is intended to be heated by the element 22, and is intended to contain a surface treating substance 25 such, for example, as wax, so that the

latter may be heated to a fluid state and fed by gravity through a series of openings 26. These openings 26 are formed in an insert 33 that is arranged within a circular opening 37 that is formed in the mounting section 36 (Fig. 2). From the openings 26 the wax or other surface-treating material flows into the cleaning or polishing elements 27 to 32 inclusive, of absorbent material, by which the wax or other surface-treating material is transferred to the surface to be cleaned or polished. To provide access to the well 24 the apertured insert 33 is detachably secured to the base of the mounting, that is, the mounting section 35, by means of screws 34 (Fig. 2).

Arranged over the outermost fold or fabric layer 27 is a relatively stiff metal or the like guard 38 which is detachably secured to the housing 12 of the motor shaft 14 by means of a clamping ring 39. At its lower end this guard has an annular strengthening rib 40. In applying or removing this guard, the polishing head is first detached from the chuck.

To clamp the fabric cleaning or polishing element 27 to the section 13 of the mounting, a retaining ring 41 is arranged on the mounting section 13 (Figs. 2 and 3). Pivotally mounted on a reduced neck portion 43 of the mounting section 13 are two clamping members 42. These clamping members 42 are arranged within the annular plate 41 and bind the inner end portion of the flexible cleaning or polishing element 27 against the neck portion 43 of the mounting section 13. The clamping members 42 are substantially semi-circular in plan, (Fig. 3), are pivotally connected together at their ends, as at 44 (Fig. 3), and are urged by springs 45, arranged at their pivotal connections 44, into binding engagement with that portion of the cleaning and polishing element 27 that encircles the reduced neck 43 of the mounting section 13.

Formed on the radially inner side of the retaining ring 41 is an annular flange 46 and provided in the radially outer edge portion of the retaining ring 41, at intervals therearound, are slots 47, upwardly through which project binding posts 48 which are carried by the mounting section 13. Slidably retained on the ring 41 by the co-action of the flanges 46 and the binding posts 48, is an annular clamping plate 50 which has projecting portions 51 that are engageable under the binding posts 48.

To remove the fabric layer 27 from the mounting when it becomes soiled and unfit for use, during the operation of cleaning or polishing a surface, and so as to expose a clean and unused surface-treating element (28) to the surface being treated, the guard 38 is removed by detaching the mounting from the motor chuck, the ring 50 being then rotated to disengage the projecting ears 51 thereof from engagement with the binding posts 48; the retaining ring 41 and the ring 50 carried thereby are then lifted off the binding posts 48; and the clamping members 42 are pivotally spread apart, thus releasing the fabric 27 from binding engagement with the mounting section 13 whereupon the fabric 27 may be readily removed from the device.

To clamp the flexible fabric cleaning or polishing element 28 to the mounting the following arrangement is provided (Figs. 2 and 4):

To this end an annular groove 52 is formed in the mounting section 13 and the inner end portion of the fabric 28 is pulled down over the binding posts 48 and inserted into the groove 52 wherein it is held by two annular split or segmented clamping rings 53 and 54, (Fig. 4), corresponding segments of which are urged apart by springs 55 arranged therebetween.

To release the inner end portion of the fabric cleaning or polishing element 28 from the mounting section 13 (after the cleaning or polishing element 27 has been used, or soiled and removed) a suitable instrument may be inserted into the groove 52 to raise the segmental clamping rings 53, whereupon the segmental clamping rings 53 and 54 may be lifted out of the groove 52 and the inner end portion of the fabric 28 pulled out of the groove 52, over the binding posts 48, and thus removed from the mounting.

The inner end portion of the flexible cleaning and polishing element 29 is led (Fig. 2) over an annular upraised flange 56 that is formed on the mounting section 35, and is attached to a series of coil springs 57. These springs 57 are detachably secured to, and are suspended from, a ring 58 which is threaded onto the mounting section 13. These springs 57 are held under tension by a ring 59 which encircles the mounting section 13 and is attached to the latter by a series of right-angularly formed arms 60. These arms project from the mounting section 13 and are arranged radially therearound.

Each of the springs 57 has an attaching element in the form of a hook 61 at its outer end and these hooks 61 are engageable in the fabric cleaning or polishing element 29 so that after the flexible cleaning and polishing elements 27 and 28 have been removed the cleaning and polishing element 29 may be readily be removed from the mounting, to present a clean or unused element (30) to the surface being treated, by detaching the hook elements 61 from the cleaning and polishing element 29.

To detachably secure the inner end portion of the flexible cleaning and polishing element 30 to the mounting the following construction is provided:

Formed in the upper surface of the mounting section 35 is an annular groove 62 and hingedly mounted on the mounting section 35 as at 63, and arranged at radial intervals therearound, above the groove 62, are pivoted holding dogs 64, each of which has a projecting tooth 65. When not in use these dogs 64 drop by gravity into vertical position (counter-clockwise, Fig. 2). The inner end portion of the cleaning or polishing element 30 is led over the upraised flange 56, is attached to each of the dogs 64, which are thereby held in extended or horizontal position (as in Fig. 2); and thence the end portion of the cleaning or polishing element 30 is led into the groove 62 wherein it is held by an inner ring 66 composed of segmental sections and a similar segmental outer ring 67; these rings 66 and 67 being urged apart by springs 68.

After removal of the cleaning or polishing elements 27, 28 and 29, the cleaning or polishing element 30 may be removed from the mounting, to present a clean, unused cleaning or polishing element (31) to the surface being treated, by removing the rings 66—67 from the groove 62, and then detaching the cleaning or polishing element 30 from the hooks 65 of the pivotal holding dogs 64.

The inner end portion of the flexible cleaning or polishing element 31 is attached to the mounting section 35 by being led over the flange 56 and thence attached to the hooks 65 of the holding dogs 64 (Fig. 2). Further to assist in holding the inner end portion of the flexible element 31 a

clamping ring 69 is provided, this ring 69 having a yieldable clamping portion 70 that is U-shaped in cross-section (Fig. 2). This yieldable U-shaped portion 70 of the clamping ring 69 is slipped over that portion of the cleaning and polishing element 31 that is extended over the flange 56.

After removal of the flexible cleaning and polishing elements 27 to 30 inclusive, the cleaning or polishing element 31 may be removed from the mounting section 35, to present a clean, unused cleaning or polishing element (32) to the surface being treated, by removing the clamping ring 69—70 from the flange 56 of the mounting section 35 and then detaching the element 31 from the hooks 65 of the pivotal holding dogs 64.

The following arrangement is provided for detachably clamping the inner end portion of the innermost cleaning and polishing element 32 upon the mounting section 35:

Carried by the mounting section 35 are pairs of opposed U-shaped trunnion brackets 78 which are swivelly mounted on threaded studs 79 that are screwed into the mounting section 35 (Fig. 2). Journaled in the brackets 78 are trunnion studs 80 for clamping rolls 81, each of the brackets 78 being pivotally connected together in series by small universal joints 79' so that the clamping rolls 81 are thereby joined together into a flexible ring and their end portions flexibly articulated or connected together as at 79', for conjoint rotation.

The inner end portion of the outermost cleaning or polishing element 32 is fed between the two concentric rings of clamping rolls 81 and is thereby detachably clamped upon the mounting, and the outer rollers are each provided with lateral pins 81' which prevent escape of the cloth once it has been fed between the rollers unless the outermost roller is turned to prevent the pins from catching the cloth.

The following arrangement is provided for tensioning the innermost fold or cleaning and polishing element 32:

To this end there are slidably arranged between the mounting sections 35 and 36 a member 83 which includes a series of segmental plates 71 each of which is joined at its inner end to a flexible ring portion 82 (Fig. 6) which is formed as a part of the member 83. Each of the segmental plates 71 has an annular flange 72 and formed in these flanges 72 are cam slots 74. Guided for movement in these slots 74 are studs 73 which are carried by a ring 75 that is slidably mounted upon the flanges 72 of the member 83. Formed in each of the segmental plates 71 of the member 83 is a slot 76 (Figs. 2 and 6) and guided for movement in each of these slots 76 is a headed bolt 77; the segmental plates 71 being slidably mounted upon the mounting section 35 by means of these headed bolts 77 and the slots 76.

Suitable openings or hand holes (not shown) may be provided at appropriate points in the innermost polishing cloth or element 32 and after this element has been applied as in Fig. 2 and before the remaining cloths are applied, it may be tensioned by inserting the fingers through these holes, grasping any one of the studs 73 and holding the same stationary while rotating the member 83 (clockwise, Fig. 6). This movement of the member 83 causes the outer edge parts of the segments 71 to travel radially outwardly in the slots 74 (Fig. 6), against the upstanding lip or rim 36' of the rubber bottom pad 36 to push the pad rim against the innermost cleaning or polishing element 32, thereby tensioning the element 32 and drawing the inner end portion of the same taut between the clamping rings 81. During this movement the segmental plates 71 move radially outwardly (Fig. 6), thereby expanding the ring portion 82 of member 83. To release the tension upon the innermost cleaning or polishing element or fold 32 the member 83 is rotated counter-clockwise, Fig. 6. During this movement the segments 71 travel radially inwardly and the flexible ring portion 82 of member 83 contracts.

Fig. 7 illustrates a modified form of device for detachably securing a mounting section, such as 13, to the motor shaft and therein the motor shaft is indicated at 84 and the reduced neck of the mounting is indicated at 85. Formed in the neck 85 of the mounting is a socket 86 which receives the motor shaft 84, and arranged in this socket 86 so as to urge the motor shaft 84 outwardly therefrom is a spring 87.

Formed in the neck 85 of the mounting section is a slot 88 and pivotally mounted in the neck 85 for movement in this slot is a lever 89. Provided in the shaft 84 is a socket 90 and slidably arranged in this socket 90 is a latch element 91 which is urged outwardly, relative to the shaft 84 and into latching engagement with the slot 88, by a spring 92 that is arranged in the socket 90, thereby latching the motor shaft 84 and the neck 85 of the mounting section together; these parts being detached by rotating the latch lever 89 (clockwise, Fig. 7) on its pivot 93, to force the latch element 91 out of the slot 88.

A modified form of the new apparatus is shown in Figs. 8 to 13 and therein a substantially frusto-conical holder body is indicated at 180. This holder body is adapted to hold or carry one or more surface-treating, that is cleaning and/or polishing members 181, 182 removably attached to the shaft of a motor 184 so as to be operated thereby. To this end a series of fastening elements in the form of screws 185 are mounted in the smaller end of the body 180 and an attaching member or plate 186 is fitted onto a stud shaft 187, the outer end of which is received in a sleeve 188 carried by the shaft of the motor 184, the outer end portion of the stud shaft 187 being releasably latched to the sleeve 188 by means of a spring urged latch pin 189, and a key-pin 189'.

The attaching member 186 includes a series of radially arranged arms 190 each of which is provided with a slot 191 (Fig. 10) and these slots are adapted to receive the headed end portions of the screws 185 so as to clamp the holder body 180 releasably to the stud shaft 187. In addition to the aforementioned arrangement for attaching the holder body 180 to the stud shaft 187 and to the shaft of the motor 184, an axially extending recess 192 is formed in the smaller end of the holder body 180 and this recess 192 receives a plug or insert 193 which has an axially extending centrally disposed bore 194 formed therein. Arranged at intervals radially around the central bore 194 and extending axially thereof is a series of grooves 197 (Figs. 9 and 11) which parallel the axis of the bore 194. A series of projections or lugs 196 are formed on the inner end of the stud shaft 187 and arranged radially therearound, these projections 196 being slid into the axial grooves 194 and entered in the grooves 197 during the operation of attaching the holder body 180 to the stud shaft 187, which operation will be de-

scribed more fully hereinafter. The pins or lugs 196 couple the head for rotation with the stud shaft.

The new apparatus includes a resilient buffer disc or pad 183, made of rubber or like material, arranged over the larger end of the holder body 180 (Fig. 9). Enveloping the holder body 180 and having a portion extended over the resilient disc 183 is a flexible, fabric, surface-treating member 181 which has a portion 181' (Fig. 9) that is inserted into the recess 192 formed in the body 180 and held therein by the insert 193. This portion 181' is pressed down over the screws 185 and perforated to receive the heads of the latter and lies between the smaller end of the holder body 180 and a plate 198 which is mounted on the smaller end of the holder body. This plate 198 prevents withdrawal of the insert 193 in the recess 192 and has apertures 199 formed therein to receive the screws 185. Also formed in the plate 198 in the outer face thereof is a recess 200 which receives an annular flange 237 formed on the stud shaft 187.

The new apparatus may be used with or without the fabric surface-treating member 181 which is preferably made of cloth, such, for example, as linen. This surface-treating member 181 may be used as a cleaning or polishing agent and when used with the resilient disc 183 the latter provides a resilient vibration and shock-absorbing base for the surface-treating member 181 so as to absorb the shocks and vibrations which occur when the device is in use, during the surface-treating operation. This feature is of especial significance when the surface being treated is an irregular one such, for example, as carved woodwork or the like.

To hold the surface-treating member 181 in engagement with the side walls of the holder body 180 annular grooves 202 and 203 (Fig. 9) are formed in the mid portion of the holder body 180 and a split conical sleeve member 204 is slipped around the body 180, this sleeve member 204 having a spring hinge joint 209 (Fig. 11) between its component parts and having annular ribs 205 and 206 on its inner side receivable in the grooves 202 and 203, respectively, to force portions of the fabric surface-treating member 181 into, and to bind the same in, the grooves 202 and 203. To bind the split sleeve 204 about the mid portion of the holder body 180 a split clamping ring 207 is slid over the smaller or neck portion of the holder body 180 and over the sleeve 204 (Figs. 9 and 12). This clamping ring 207 has a conventional toggle or link mechanism 208 connecting its component sections for contracting the same into clamping engagement with the sleeve 204.

As hereinbefore stated, the resilient disc or pad 183 may be used as a buffer, without the flexible, fabric cleaning member 181. To remove the fabric cleaning member 181 the sleeve 188 is separated from the stud shaft 186 by unlatching the pin 189, and the ring 186 is removed from the holder body by rotating the holder body (clockwise, Fig. 10), whereupon the plate 198 is slipped off the screws 185. The plug or insert 193 is then slid out of the recess 192 and the split clamping ring 207 is expanded by manipulating the toggle joint 208, whereupon the expanded ring 207 may be taken off the holder body and the sleeve 204 removed by spreading the latter at its spring hinged joint 209. The holder body 180 may then be separated from the stud shaft 187 by sliding the plug insert 193 out of the recess 192 whereupon the flexible cleaning member 181 may be removed from the holder body. The resilient disc 183 may then be used as a buffer or polishing member; for this purpose the holder body 180 being re-attached to the stud shaft 187, which may be accomplished by re-inserting the plug 193 in the recess 192 while at the same time slipping the plate 198 over the screws 185, and then re-attaching the clamping plate 186 by rotating the holder body (counter-clockwise, Fig. 10).

To hold the resilient buffer disc 183 on the holder body an axially extending bore 210 (Fig. 9) is provided in the larger end of the holder body and a plug or insert 211 is inserted into this recess or bore. This plug 211 is attached to the disc 183 by means of a pair of spaced annular flanges 212 and 213 arranged on opposite sides of the disc, the flange 212 fitting into a recess 214 (Fig. 9) that is formed in the outer surface of the disc 183.

To latch the plug or insert in the axial recess 210, a pair of spring-urged latching pins 215 are slidably mounted in the holder body 180. Each of these latching pins has an inner end portion 216 that is urged, by means of a spring 218, into latching engagement with a correspondingly shaped recess 217 formed in the insert 211, the springs 218 being arranged in recesses 219 that are formed in the holder body. Each of these springs 218 bears at its inner end against a flange 220 that is formed on each of the latch pins 215.

To remove the resilient buffer disc 183 from the holder body the flexible member 181 is first removed from the holder 180 in the manner hereinbefore described, and the latch pins 215 are then retracted against the action of the springs 218 to remove their latching end portions 216 from the recesses 217 formed in the insert 211, whereupon the disc 183 may be removed from the holder body 180 by sliding the insert 211 out of the bore 210 while holding the latch pins 215 in retracted position.

In order to replace the disc 183 and insert the plug 211 carried thereby into the bore 210, the latch pins 215 are retracted and held in retracted position and the disc 183 placed in position as in Fig. 9 with the plug 211 inserted into the bore 210, whereupon the latch pins 215 are released and are then urged by their springs 218 into latching engagement with the plug 211.

The innermost flexible surface-treating member 182 is preferably a woolen or like fabric cloth and this member may be used to treat a surface, for cleaning or polishing purposes, by removing the surface-treating members 181 and 183 in the manner hereinbefore described.

To hold the flexible surface-treating member 182 upon the holder body 180 an enlarged axial recess 221 (Fig. 9) is provided in the larger end of the holder body and a cup-shaped insert 222 is frictionally fitted into this recess 221. The flexible member 182 is stretched across the larger end of the holder body 180 and a portion thereof is inserted into the cup-shaped insert 222, whereupon a second cup-shaped insert 223 is inserted into or nested in the cup 222 to bind a portion of the flexible member 182 between the nested cup-shaped inserts 222 and 223, which are provided with apertures 225 and 224, respectively, for the passage of the insert 211.

Further to assist in clamping the surface-treating member 182 upon the holder body 180, an annular shoulder 226 is provided on the larger end of the holder body 180 and an annu-

lar groove 227 is formed in this shoulder portion 226. This groove 227 receives a portion 228 of the flexible surface-treating member 182 and this portion is removably retained in the groove 227 by the wedging action of a clamping ring 229 which fits into the groove and which is substantially V-shaped in cross section (Fig. 9). To facilitate holding the clamping ring 229 in the groove 227, resilient latching fingers or portions 230 are struck out of the ring 229 at intervals therearound and these lug portions 230 are releasably received in corresponding indentations or notches formed in the shoulder portion 226 of the holder body 180 (Fig. 9). To release the clamping ring 229 from the groove 227 the resilient or yieldable fingers 230 may be bent back out of the indentations 231 by means of a suitable tool inserted in the groove 227.

Better to secure the inner end portions 232 of the portion 181' of the flexible cleaning member 181 in position, hook elements 233 are provided on the inner end of the shaft 187 (Fig. 9) and the inner end portion 232 of the flexible member 181 is attached to these hook portions.

A modification of a certain feature of the invention is illustrated in Fig. 13, and there is shown a plate 234 which is similar to the plate 186 and for the same purpose, but has bayonet slots 235 formed therein at radial intervals therearound to receive the headed ends of the screws 185.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, the illustrated device is susceptible of variation and modification, without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as some within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

1. In a device of the class described: a mounting having a relatively wide polishing base and a relatively narrow mounting neck; a motor; means for attaching the said neck of the mounting to the motor; a plurality of separate, flexible, surface-treating elements extended over said base in superimposed relationship; and means arranged on said mounting and spaced apart at different levels in the direction between said base and neck for detachably securing each of said elements to said mounting.

2. In a device of the class described: a mounting; a motor; means for attaching said mounting at one end thereof to the said motor; a plurality of pervious flexible cleaning and polishing elements extended one upon another over the end of said mounting which is opposite the said end thereof that is attached to said motor; and means arranged in terraced formations around said mounting between said ends thereof for detachably securing said elements to the said mounting between the said ends thereof, said opposite end of the mounting having a well formed therein to receive a polishing substance, and means providing a perforate bottom cover for said well and arranged to communicate said polishing substance to the innermost polishing element for communication through the remaining elements.

3. In a device of the class described: a mounting; a motor; means for attaching said mounting at one particular end thereof to the said motor; a plurality of permeable flexible cleaning and polishing elements laid one upon another over an opposite end of said mounting from said particular end thereof; and means for detachably securing said elements to said mounting between the said ends theerof; said mounting having a well formed therein and opening out upon the external surface of said mounting at the second-named opposite end thereof and said well being adapted to contain a cleaning or polishing substance, and means attached to said mounting and providing a bottom for said well and a padding for said end of the mounting and over which said polishing elements are laid to be detachably secured as aforesaid, and means having formations through which said polishing substance can move into said polishing elements.

4. In a device of the class described, a polishing head including a member having a substantially flat base portion and a plurality of ledge formations receding upwardly toward the top of said member, a plurality of fluid permeable surface treating elements arranged one upon another on said base and each having marginal extremities draped back into one of said ledge formations, mechanism in said ledge formations for detachably engaging the corresponding marginal portions of said surface treating elements, a reservoir within said member for retaining a quantity of surface treating substance of a type adapted for fluid movement, said reservoir having an open bottom portion communicating into said base, means providing a fluid permeable bottom for said reservoir on said base whereby surface treating fluid may be communicated from within the reservoir to permeate said surface treating elements.

5. A polishing device in the form of a substantially conical member having means in its smaller end or top for attachment with a driving member and being provided with a plurality of annular terraced formations between said top and the base thereof, a plurality of polishing elements arranged one upon another over said base and each having terminal portions extending into one of said terraced formations and removably secured therein by attaching mechanism mounted thereon.

6. A polishing device including a conically shaped mounting having a wide base portion and a small top portion with a plurality of circumferentially extended step levels arranged thereabout between said base and top portion, mechanism arranged in each of said step levels for attaching engagement with the terminal portions of flexible polishing elements, and a plurality of flexible polishing elements arranged one upon another over said base portion and each having a terminal portion extended into one of said step levels for attaching engagement with the aforesaid mechanism therein, and means in said top end of the mounting providing a chuck drivingly engageable with a motor shaft for removably attaching the mounting to a motor for rotating the mounting.

7. The device of claim 6 further characterized by the provision of a central well in said base portion, and a removable perforate closure for said well mounted on said base and by means of which a polishing or cleaning fluid in the well may be communicated with said polishing elements.

8. A polishing device in accordance with claim 6 and further characterized by the provision of a central well in said base portion, and a removable perforate closure for said well mounted on

said base and by means of which a polishing or cleaning fluid in the well may be communicated with said polishing elements, an electric heater element arranged in said well for the purpose of heating a polishing or cleaning substance therein, commutating contact means arranged in said top end of the mounting around said chuck and electrically connected with said heater element, said commutating contact means being engageable with stationary contact means on said motor and connected with a source of electric power to energize said heater element when the mounting is rotating.

9. In a power driven polishing device having a motor and drive shaft, a mounting in the form of a substantially frusto-conical head having a chuck in the frustum part thereof for driving connection with said drive shaft, commutating contact means arranged around said chuck and engaged by stationary contact means on said motor for connecting said commutating means with a source of electric power while the head is rotating, a central well arranged in the base of said head and provided with closure means on said base, and polishing means arranged over said closure means on said base and removably attached to said head by mechanism arranged thereon between the base and frustum thereof, said closure having formations through which a polishing substance in said well can contact said polishing means, and an electric heating device in said well and electrically connected with said commutating means.

10. In a polishing device, an electric motor having a substantially cylindrical hub portion with a drive shaft extended therefrom and stationary contact means flanking said shaft, a polishing head of frusto-conical form having a shaft-engaging chuck arranged in its frustum top for driving connection with said motor, traveling contact means arranged in said frustum top bearing contact with said stationary contact means, a polishing element arranged over the base of said head and removably attached thereto, housing means in said head for retaining a quantity of polishing substance of a type adapted to be heated and communicated in fluid form with said polishing element, electrical heating means in said head for heating said substance and having electrical connection with said traveling contact means, and means for communicating said fluid polishing substance to said polishing element.

11. A polishing device in accordance with claim 10 and further characterized by the provision of a substantially conically shaped shield open at its base and opposite ends and removably clamped to said hub over said polishing head so as to leave only said base portion exposed.

12. A polishing device including a motor, a substantially conically shaped polishing head provided with means for removably attaching the same to said motor, a plurality of polishing elements arranged one upon the other over the base portion thereof and having terminal portions extending up into the region between the base and opposite end of the head and attaching mechanism arranged on said head at different levels between said base and opposite end thereof for removably securing said terminal portions of the polishing elements to attach the latter to the head.

13. The device of claim 12 in which said attaching mechanism is in the form of a plurality of roller members arranged end to end in circumferential array and interconnected by universal joints to provide an inner ring of rollers, said inner ring being surrounded by an outer ring of similarly arranged rollers having their peripheries positioned close to those of the inner ring of rollers, and the rollers of one of said rings each having a radially projecting pin member for attaching engagement with a polishing element.

14. The device of claim 12 in which said attaching mechanism is in the form of concentric rings of segmental elements arranged in an annular channel formation in said head with the segments of said rings urged in opposite directions away from each other by spring means whereby the outermost edge portions of said elements may be urged against a polishing element to clamp the latter against said channel formation.

15. A polishing head of substantially frusto-conical shape and having a substantially cylindrical intermediate portion provided with an annular ledge therebelow between the same and the base of the head, and means for attaching polishing cloths and the like to said head, said means including a ring member mounted on said cylindrical portion of the head, spring members attached to said ring and extensible in a radial direction therefrom, said spring members having hooked extremities for hooking engagement with terminal portions of polishing cloths draped over the base of the head with terminal portions extended over said annular ledge for engagement with said springs, and a tensioning ring of larger diameter than said first-mentioned ring and attached to said cylindrical portion so as to lie concentrically therewith and in a plane below the point of attachment of said springs with said first-mentioned ring and disposed in a plane substantially below the plane of the edge portion of said ledge whereby said spring members will be tensioned when the same are attached to said polishing cloths.

16. In a polishing device, a polishing head of substantially frusto-conical form and having a terrace formation between its axial ends, and means arranged on said terrace formation for removably attaching a polishing cloth or the like draped over the base of said head, said means including a plurality of upstanding hook members over which terminal portions of said cloth are placed and laid on said terrace formation, a retaining ring having spaced radial openings and fitted onto said head and said terrace formation over said cloth portions thereon, with said hook members extending through said openings, said retaining ring having an upstanding flange formation around its inner periphery and a clamping spider rotatably mounted in said annular flange formation and having radially projecting ears moved into locked position beneath the hook portions of said hook members, whereby said retaining ring is clamped down against the terminal portions of said cloth on said terrace formation.

17. In a polishing device, a substantially conical head having an annular terrace near its base region and another means arranged around said terrace for removably attaching to said head the terminal portions of a polishing cloth, a yieldable pad member on said base and having a rim portion substantially opposite said attaching means, a polishing cloth stretched over said base region and pad member with terminal portions engaged by said attaching means, together with means for tautening said cloth and including a plurality

of segmental members arranged to form a ring and each of said segmental members being mounted on said base for sliding movement radially of the center of said ring, said segments being held in substantially annular array by a yieldable ring member fitted over projections at the inner ends of each segment, each segment having a cam slot near the outer edge, a tautening ring mounted in said head adjacent said terrace above said segmental members concentrically with respect to the aforesaid ring of segments, and a plurality of studs each having portions extending into one of said cam slots, said ring being held stationary while said ring of segments is rotated to cam each segment outwardly and against said rim portion of the yieldable pad to tauten said cloth stretched thereover.

18. In a device of the class described, a polishing head including a body having means at one end thereof for driving connection with a motor by means of which said head is rotated, the opposite end of said body having a well formed therein and opening into said opposite end, said well being adapted to retain a polishing fluid, a member arranged on said opposite end of the body and having openings communicating therethrough from said well and constituting a wall portion for the well, a fluid permeable polishing element arranged over said member and adapted to receive fluid from said well through said openings, electrically energized heating means in said body and arranged to heat a polishing substance in said well, contact means arranged in said first-mentioned end of the body and having connection with said heating means, and cooperating contact means arranged on said motor for energizing said heating means during rotation of the head.

19. A polishing head comprising a conically-shaped head member having a bottom face and a plurality of stepped annular levels disposed thereabout and receding toward the small end of the head, means in each of said stepped levels for removably engaging a polishing cloth, a well disposed centrally in said head and communicating with said bottom face, a pad member secured to said bottom face and having a plurality of openings extended therethrough in the central region thereof and communicating with said well, an electrical heater element in said well, commutator means in the small upper end of said head electrically connected with said heater element, a spindle-receiving sleeve in said upper end portion of the head having a reciprocably movable latch pin disposed for radial movement therein and latchingly engageable with said sleeve, a plurality of polishing cloths stretched over said bottom face in layers and each having their respective edge portions extended to one of said annular levels and attached to said engaging means therein.

MARION H. BISSELL.