Oct. 18, 1949. R. N. SUTTON ET AL 2,485,332

SHOE MACHINE

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FIG. 1.

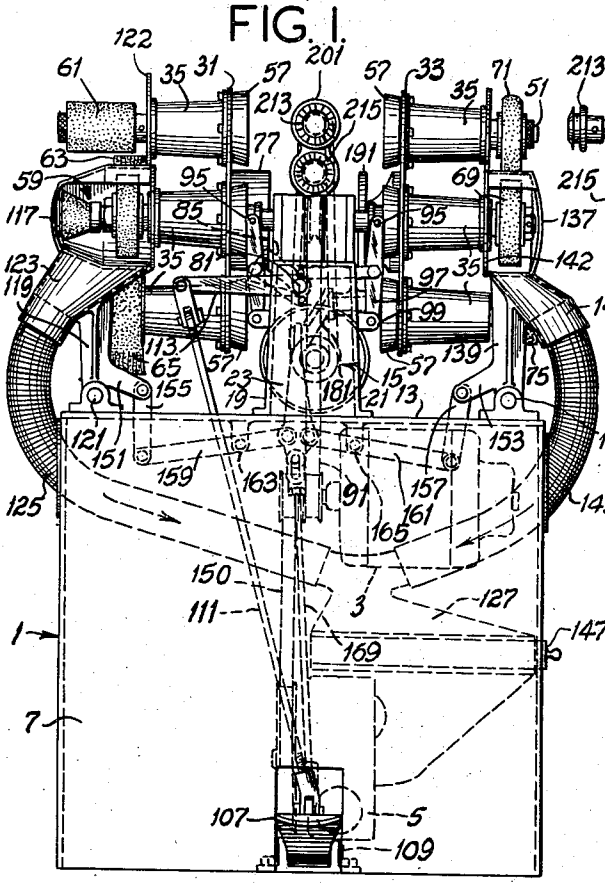


FIG. 2.

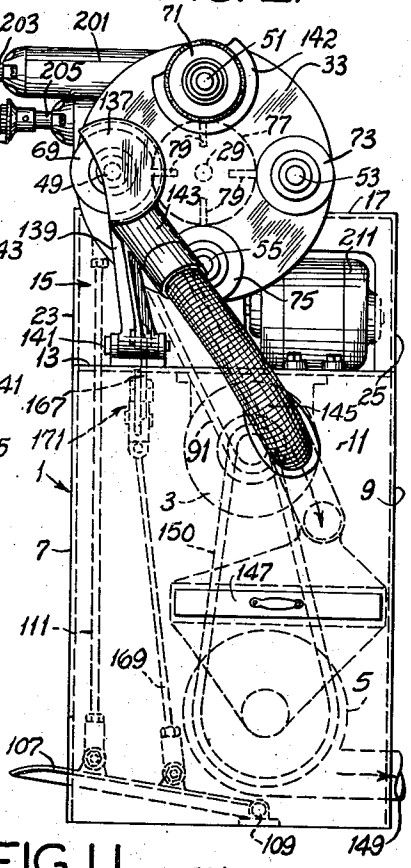


FIG. 3.

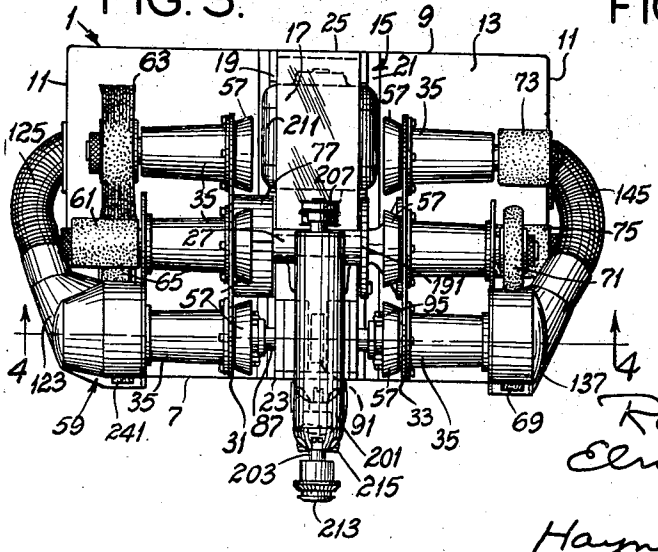
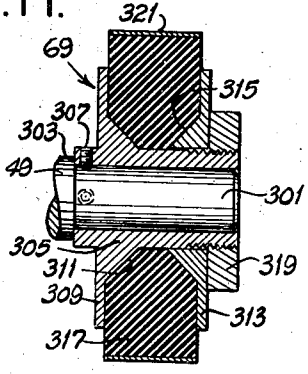


FIG. 11.



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SHOE MACHINE

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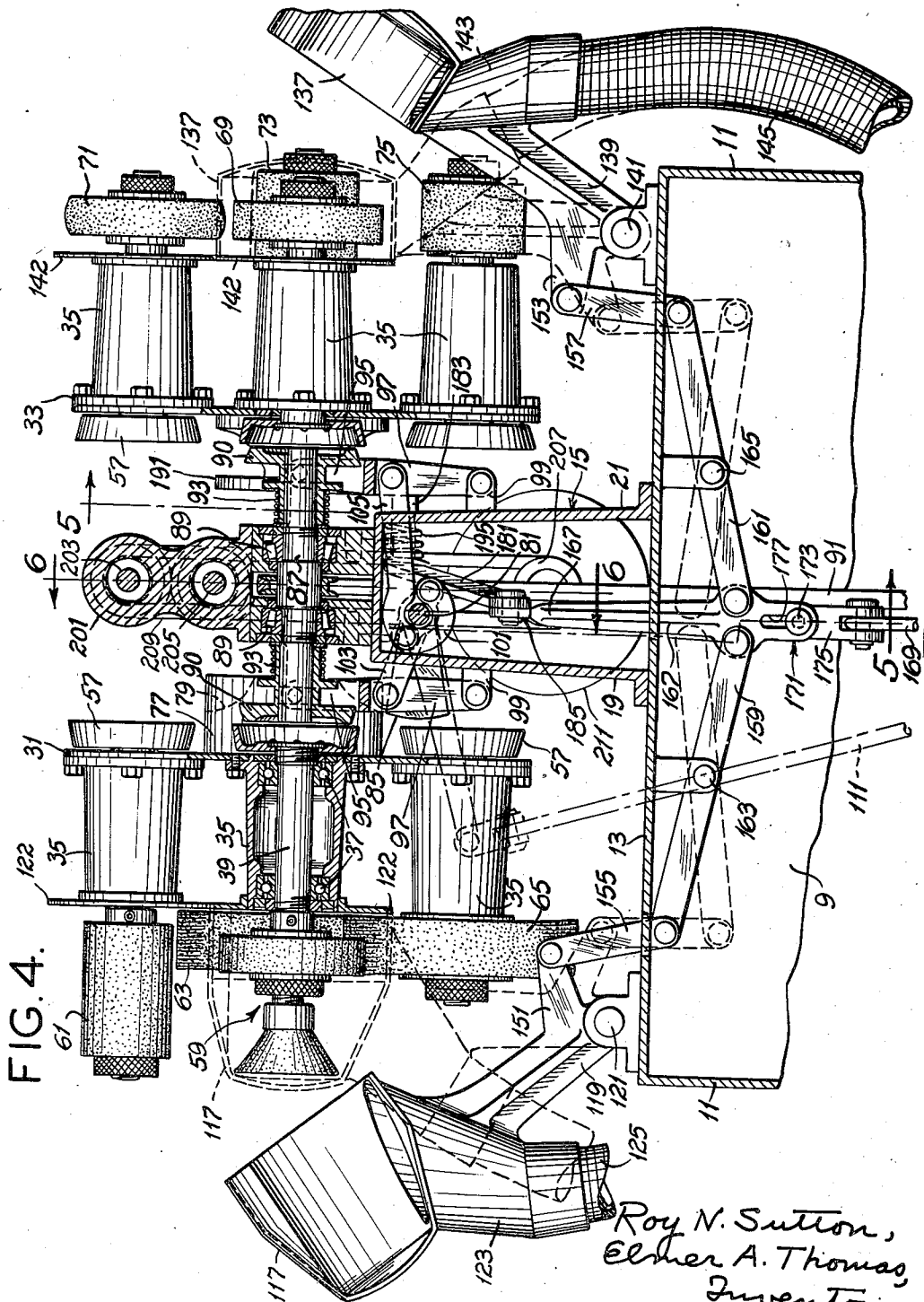


FIG. 4.

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SHOE MACHINE

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FIG. 5.

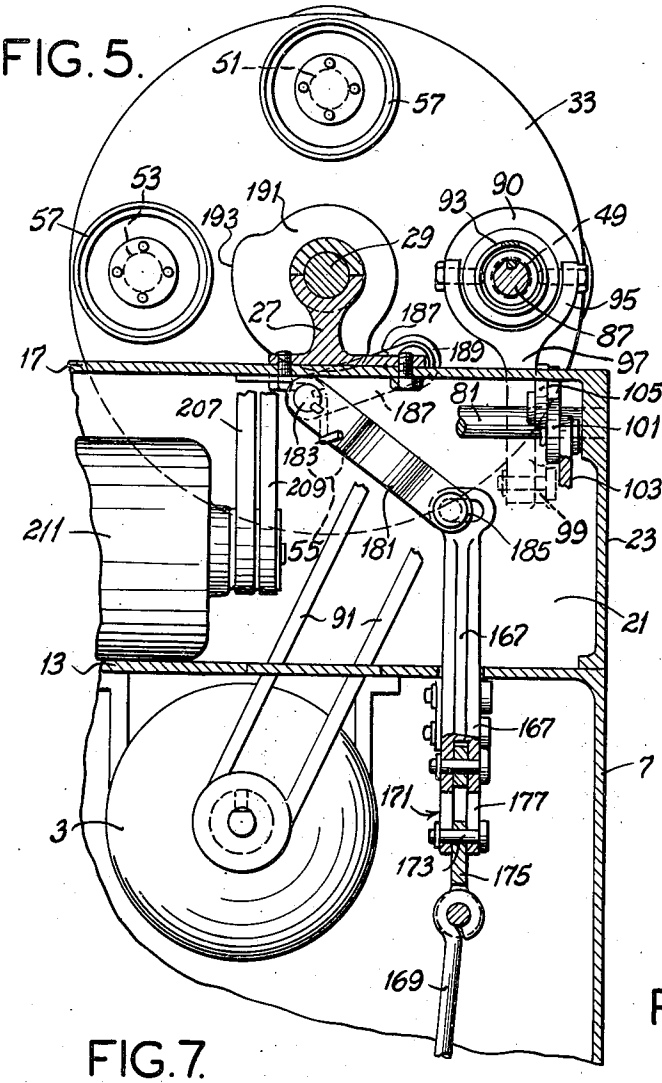


FIG. 9.

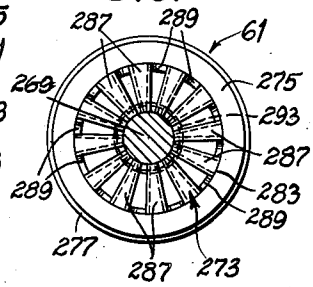


FIG. 7.

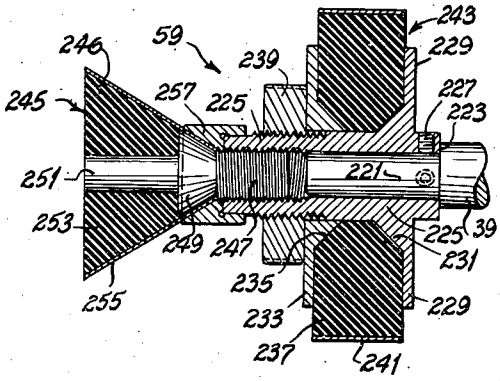
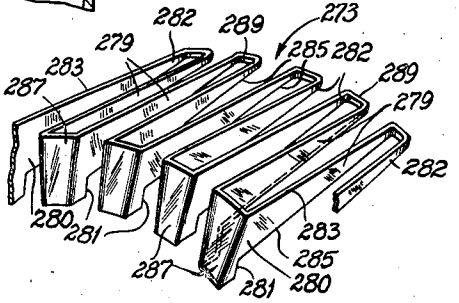


FIG. 10.



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SHOE MACHINE

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FIG. 6.

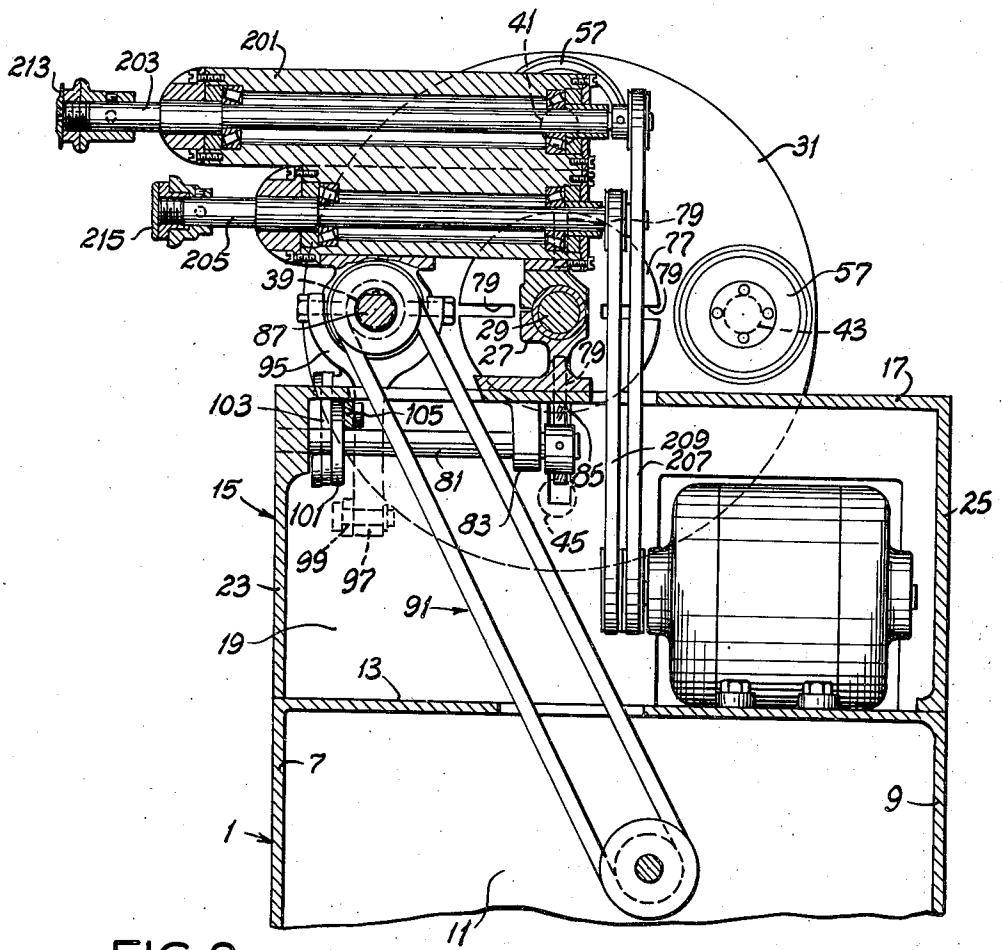
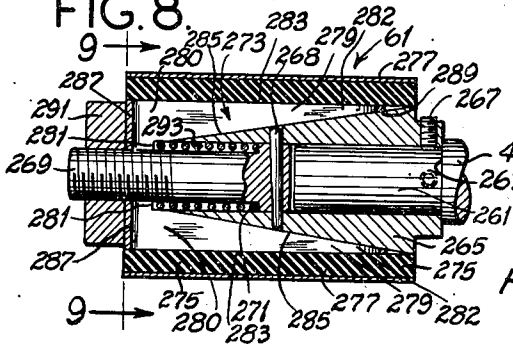


FIG. 8.



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2,485,332

UNITED STATES PATENT OFFICE

2,485,332

SHOE MACHINE

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Application March 18, 1947, Serial No. 735,294

17 Claims. (Cl. 51—166)

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This invention relates to shoe machines and, more particularly, to shoe-finishing apparatus for use primarily in repairing shoes.

Among the several objects of the invention may be noted the provision of an improved shoe-finishing or repairing machine, including an adequate number of operating tools in a compact arrangement requiring little floor space; the provision of a machine of this class which also requires little floor space for maneuvers of the operator; the provision of a machine of this class including a selectively operable dust-collection system; the provision of a machine of the class described wherein the shoe-finishing or repairing tools may be easily removed and replaced without a large amount of disassembling of machine parts; and the provision of a shoe machine such as described which is economical to construct and operate. Other objects will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated,

Fig. 1 is a front elevation of the machine;

Fig. 2 is a side elevation of the machine as viewed from the right of Fig. 1;

Fig. 3 is a plan view of Fig. 1;

Fig. 4 is an enlarged section taken on line 4—4 of Fig. 3, but illustrating in solid lines the dust-collecting hoods of the invention swung aside;

Fig. 5 is an enlarged section taken on line 5—5 of Fig. 4;

Fig. 6 is an enlarged section taken on line 6—6 of Fig. 4;

Fig. 7 is a detail sectional view of a combination heel sander and heel breaster;

Fig. 8 is a detail section of an expansible mandrel for a bottom sander;

Fig. 9 is a transverse section taken on line 9—9 of Fig. 8;

Fig. 10 is an enlarged fragmentary perspective of an expansible element of the mandrel of Fig. 8; and,

Fig. 11 is a detail section of an expansible mandrel for a heel sander.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Conventional shoe-finishing or repairing machines embody an elongate frame of considerable length in which is journalled a long shaft extending the length of the frame and carrying a plurality of shoe-finishing or repairing tools, such as sanding wheels, brushes, buffers or burnishers, etc. Such machines not only occupy considerable floor area but also require considerable additional floor area for standing and walking room for the operator, and hence cannot be used where only limited space is available. This invention provides a novel shoe-finishing or repairing machine which, while including a sufficient number of shoe-finishing or repairing tools for the usual finishing or repairing operations, occupies much less space than conventional machines, and wherein tools are selectively movable to a given working position so that less space is required for the operator. Thus, this invention provides a shoe-finishing or repairing machine primarily advantageous in that it may be located and used in a limited space.

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Referring now to Figs. 1–6 of the drawings, the shoe-finishing or repairing machine of this invention is shown to include an upright housing 1 which serves as a base for various parts of the machine and as an enclosure for a driving motor 3, a blower 5 and other parts to be described. Housing 1 comprises a front wall 7, a back wall 9, side walls 11, and a table top 13. Fixed upon the table top is an elongate supporting block 15 which extends centrally from front to rear. Block 15 is in the form of an inverted box having a top 17, side walls 19 and 21, a front wall 23 and a back wall 25. Block 15 supports a bearing 27 secured to its top 17 with the bearing axis extending transversely. A shaft 29 is centrally journalled in this bearing with its end extending from opposite ends of the bearing. An overhung carriage or turret 31 is fixed on one end of shaft 29 and a similar carriage or turret 33 is fixed on the other end of the shaft. Thus the arrangement is such as to provide a pair of axially spaced carriages or turrets connected for conjoint rotation about a common axis.

The turrets 31 and 33 are substantially identical, each comprising a disc having a hub fixed to the shaft 29. A plurality of spindle bearing housings 35 are bolted upon the outer faces of each of the discs for the reception of rotary tool spindles with the axes of the tool spindles parallel to and equidistant from the axis of shaft 29. As illustrated, each of the turrets includes four such spindle bearing housings 35 spaced at 90° intervals around the turrets, with each housing on one turret axially aligned with a corresponding

housing on the other. Each bearing housing 35 is fitted with bearings 37 (Fig. 4) wherein is journalled a tool spindle. Turret 31 thus has four spindles 39, 41, 43 and 45 and turret 33 has four spindles 49, 51, 53 and 55 journalled therein. The following pairs of spindles are axially aligned: 39 and 49, 41 and 51, 43 and 53, 45 and 55.

Each of the spindles extends through an aperture to the inside of the turrets and carries at its inner end a female cone clutch element 57 adapted to be driven, thereby to drive the spindle. The other ends of the spindles extend axially outward from the spindle bearing housings and carry shoe-finishing tools. As illustrated, spindles 39, 41, 43 and 45 on turret 31 respectively carry a combination heel sander and heel breaster 59, a bottom sander 61, a brush 63 for black shoes, and a brush 65 for tan shoes. Spindles 49, 51, 53 and 55 on turret 33 respectively carry a flat-surfaced heel sander 69, a round-surfaced heel sander 71, and heel burnishers 73 and 75.

A circular indexing latch block 77 is fixed for rotation with shaft 29 and turrets 31 and 33. It is located adjacent the turret 31. This block has four latch-receiving notches 79 spaced at 90° intervals corresponding to the spacing of the tool spindles, being thus phased therewith. A rock shaft 81, journalled in the front wall of block 15 and a bearing 83 depending from its top 17, carries a latch 85 receivable in notches 79. The arrangement is such that shaft 81 may be rocked counterclockwise, as viewed in Fig. 4, to disengage latch 85 from a notch 79, whereupon the shaft 29 and turrets 31 and 33 may be manually rotated by grasping a convenient bearing housing 35 to any one of four indexed positions wherein two of the shoe-finishing tools (one on turret 31 and the other on turret 33) are in a working position at the front of the machine so that a shoe may be applied to either tool. Shaft 81 may then rock clockwise to re-engage latch 85 in the appropriate notch 79 to latch the turrets in position. As illustrated in Figs. 1–3, spindles 39 and 49 carrying tools 59 and 69 are in working position at the front of the machine, and latch 85 is engaged in the indexing notch 79 for these spindles to latch the turrets with these spindles in working position.

A driving clutch shaft 87 is journalled in bearings 89 which are mounted upon the top of the block 15. This shaft is driven through a belt drive 91 from motor 3 mounted beneath the table top 13 in housing 1. The belt of this drive passes through suitable apertures in the table top 13 and the top 17 of block 15 (Fig. 6). Male cone clutch elements 90 are splined on the opposite ends of the shaft 87 extending from bearings 89 so as to be axially shiftable but non-rotatable thereon. Shaft 87 is so positioned that driving clutch elements 81 are releasably engageable with the two driven clutch elements 57 on two tool spindles to drive them in their working positions. The clutch elements 90 are biased toward engagement with clutch elements 57 by springs 93 reacting from the blocks for bearings 89. They are shiftable out of engagement with clutch elements 57 by means including shifting forks 95 on shifting fork levers 97 pivoted for rocking movement on pivots 99 carried by the side walls 19 and 21 of block 15.

The shifting fork levers 97 are adapted to be rocked to shift driving clutch elements 90 out of engagement with driven clutch elements 57 upon rocking of shaft 81 to release the latch 85 from an indexing notch 79. As illustrated, shaft

81 has fixed thereon a double crank 101, connected by links 103 and 105 to the shifting fork levers 97 in such a manner that as shaft 81 rocks counterclockwise (Fig. 4), links 103 and 105 rock levers 97 toward each other to shift driving clutch elements 90 toward each other and out of engagement with the driven clutch elements 57.

Pedal-operated means is provided for rocking shaft 81 counterclockwise to release the latch 85 and disengage the clutches. As illustrated, a pedal 107 is pivoted at 109 outside housing 1 and extends outward through an aperture in the front wall of the housing. The pedal is connected by a link 111 to the end of a crank arm 113 fixed on the shaft 81 and extending to the left through an aperture in the side wall 19 of block 15. Articulated connections between link 111 and pedal 107 and crank arm 113 permit the pedal to be depressed to rock shaft 81 counterclockwise. The clutch springs 93, acting through the clutch elements 90, the shifting forks and levers, the links 103 and 105, and the double crank 101, bias the shaft 81 to rock clockwise. This bias is transmitted through crank arm 113 and link 111 to the pedal 107 so that the pedal is normally maintained in raised position, in which position the latch 85 is engaged in a notch 79 and the clutches for driving the two spindles in working position are engaged.

Means is provided for collecting dust resulting from use of the combination heel sander and heel breaster 59 and the bottom sander 61 on turret 31 and from use of the heel sanders 69 and 71 on turret 33. (Use of the other tools on the turret does not necessitate dust collection.) A dust-collecting hood 117 is provided for collecting dust resulting from use of tools 59 and 61 on turret 31. This hood is carried by an arm 119 pivoted for lateral swinging movement upon a pivot 121 at the left of table top 13 so that the hood may swing outward from a dust-collecting position with respect to a tool in the working position (Fig. 1) to a retracted position clearing the tool (Fig. 4). In dust-collecting position, hood 117 engages one of closure plates 122 fixed on the bearing housings 35 for spindles 39 and 41 so as to provide a dust-collecting enclosure around tool 59 or 61. The hood has an outlet 123 connected by means of a flexible conduit 125 to the suction manifold 127 of the blower 5 within housing 1, conduit 125 passing through an aperture in the left side wall 11 of the housing.

Similarly, a dust-collecting hood 137 is provided for collecting dust resulting from use of tools 69 and 71 on turret 33. This hood is carried by an arm 139 pivoted for lateral swinging movement upon a pivot 141 at the right of table top 13 so that the hood may swing outward from a dust-collecting position with respect to a tool in working position (Fig. 1) to a retracted position clearing the tool (Fig. 4). In dust-collecting position, hood 137 engages one of closure plates 142 fixed on the bearing housings 35 for spindles 49 and 51 so as to provide a dust-collecting enclosure around tool 69 or 71. Hood 137 has an outlet 143 connected by means of a flexible conduit 145 to the suction manifold 127, conduit 145 passing through an aperture in the right side wall of housing 1.

A drawer 147, which is insertable into and removable from the suction manifold through the right side wall of housing 1, contains a suitable dust collector, such as a filter, for collecting dust. The collector may be removed for cleaning or replacement simply by pulling out the drawer. The blower exhausts through a duct 149 extend-

ing through the back wall 9 of the housing 1. It is driven by a belt drive 150 from motor 3.

The dust-collecting hoods 117 and 137 are swingable laterally to clear all the tools so as to permit turrets 31 and 33 to be rotated to bring any desired tools to working position at the front of the machine. It is preferred to correlate swinging of the hoods with the operations of releasing the turret latching means and disengaging the clutches. To this end, means is provided for swinging the hoods laterally outward to retracted position concurrently with depression of the pedal 107.

As illustrated, dust hood arms 119 and 139 are provided with cranks 151 and 153, respectively. These cranks are connected by links 155 and 157 to the outer ends of rocking levers 159 and 161, which are pivoted at 163 and 165 beneath table top 13. The inner ends of rocking levers 159 and 161 are connected by pin and slot joints to a member 167 adapted to reciprocate vertically in an aperture in the table top 13. The pedal 107 is linked to reciprocable member 167 by a linkage including a connecting rod 169 and a lost-motion connection 171. The latter comprises a pin 173 extending from an articulated link 175 at the upper end of rod 169 through a vertical slot 177 in the lower end of member 167. The purpose of this lost-motion connection will appear.

The arrangement is such that when pedal 107 is depressed to disengage the turret latch and the clutches, connecting rod 169 is pulled down so that pin 173 pulls down member 167 to the solid-line position of Fig. 4. This rocks the outer ends of levers 159 and 161 upward and, through links 155 and 157 and cranks 151 and 153, swings arms 119 and 139 laterally outward to retract the hoods 117 and 137. The conduits 125 and 145 are made sufficiently flexible to permit swinging movement of the hoods.

In the illustrated embodiment of the invention, hood 117 is too small to accommodate the brushes 63 and 65 (which are of larger diameter than the hood 117), and hood 137 is too small to accommodate the heel burnishers 73 and 75 (which are wider than the hood 137). As previously mentioned, dust collection is not required when tools 63, 65, 73 and 75 are used. The hoods are not made large enough to accommodate these tools as it is desirable that the hoods be as small as possible to reduce the necessary blower capacity. It is therefore desirable to maintain the hoods swung aside in retracted position when any of tools 63, 65, 73 and 75 are in working position, inasmuch as the hoods will not fit over them.

To provide for maintaining the hoods swung aside when these tools are in working position, a cam-controlled lever 181, fixed on a rock shaft 183 journalled in the side wall 21 of block 15, is connected by a pin and slot joint 185 to the upper end of the reciprocable member 167. Shaft 183, outside the block 15, carries a follower lever 187 having a cam follower 189 at its free end adapted to engage a plate cam 191 fixed for rotation with shaft 29 and the turrets adjacent turret 33. The cam has a lobe 193 which is of such arcuate extent and so phased as to maintain levers 187 and 181 and consequently member 167 depressed when either of paired spindles 43, 53 or paired spindles 45, 55 are in working position. With member 167 depressed, the hoods 117 and 137 are swung aside to retracted position, as illustrated in solid lines in Fig. 4. A spring 195 is provided to bias the cam follower lever 187 toward the cam. The lost-motion connection 171 permits upward

movement of pedal 107 to latch the turrets and engage the clutches even though member 167 is maintained in depressed position.

The machine is also illustrated as provided with a bearing housing 201 mounted on top of the bearings 27 and 89 for the reception of two spindles 203 and 205, one above the other, extending transversely with respect to turret shaft 29. These spindles are adapted to be driven by individual belt drives 207 and 209 from a motor 211 mounted on the table top 13. The upper spindle 203 carries an edge trimming tool 213 on its free end extending forward from the bearing housing. The lower spindle 205 carries a top lift cutter or trimmer tool 215 on its free end extending forward from the bearing housing. Suitable dust-collecting means (not shown) may be provided for tools 213 and 215.

Operation of the above-described shoe-finishing or repairing machine is as follows:

As illustrated in Figs. 1–3, spindles 39 and 49 carrying the combination heel sander and heel breaster 59 and the flat-surfaced heel sander 69, respectively, are in working position at the front of the machine. The pedal 107 is raised. Rotation of the turrets is prevented by engagement of latch 85 in the indexing notch 79 corresponding to paired spindles 39 and 49 and tools 59 and 69. The driving clutch elements 90 are engaged with the driven clutch elements 57 on spindles 39 and 49 to drive them and rotate the tools 59 and 69 thereon. The cam follower 189 is biased by spring 195 into engagement with the low portion of the periphery of cam 191, and member 167 consequently is raised. Hoods 117 and 137 thus are swung inward over tools 59 and 69 and collect dust resulting from use thereof.

Assuming that the operator should require either of paired tools 61 or 71 (bottom sander or round-surfaced heel sander) for operation upon a shoe, he will depress pedal 107, thus rocking shaft 81 counterclockwise to release the turret latch 85 from the notch 79 and to disengage the clutch elements, and pulling down member 167 to swing aside the hoods 117 and 137 in the manner previously described and as illustrated in Fig. 4. This permits rotation of the turrets 31 and 33. He then grasps one of the spindle bearing housings 35 and rotates the turrets to bring tools 61 and 71 to the working position. The pedal may be released when the turrets have been partially rotated, since engagement of latch 85 with the periphery of latch block 77 will maintain it depressed. When tools 61 and 71 are in the working position, latch 85 automatically snaps into the corresponding indexing notch, shaft 81 rocking clockwise due to the biasing action of springs 93, and the clutches re-engage to drive spindles 41 and 51 and tools 61 and 71. Clockwise rotation of crank arm 113 lifts link 111 to return the pedal to raised position. The cam 191 is rotated to such angular position that cam follower 189 is again biased by spring 195 into engagement with the low portion of the cam periphery so that member 167 is raised to swing the hoods 117 and 137 inward to dust-collecting position over tools 61 and 71.

Assume now that it is desired to use either of paired tools 63 or 73 (black shoe brush or heel burnisher). The operator will depress the pedal and rotate the turrets as above described to bring these tools to the working position. The cam 191, however, now becomes rotated to such angular position that the cam follower 189 engages

the lobe of the cam to hold member 167 in depressed position. This holds aside the hoods 117 and 137. The pedal 107, however, is lifted to its raised position, latch 85 snaps into a notch 79, and the spindle driving clutches are engaged, since the lost-motion connection 171 permits movement of these elements independently of member 167. Thus, even though member 167 remains depressed, pin 173 of the lost-motion connection rises upward in the slot 177 thereof as the pedal lifts to raised position. The operation is the same when tools 65 and 75 are brought to working position.

The above-described shoe-finishing or repairing machine thus includes a plurality of shoe-finishing or repairing tools sufficient in number for the ordinary finishing or repairing operations in a compact apparatus which takes up comparatively little floor space. In a typical embodiment the machine occupies only about six square feet of floor area. Also, all the tools are selectively accessible to an operator standing within a limited space. Another important advantage of the machine of this invention is that the spindles have accessible ends for the tools, and the tools may be readily applied to or removed from them without disassembly of shafts from bearings, as in prior machines. Also, since less than the entire number of spindles are driven at one time, and since dust is collected at only two tools, less power is required to drive the spindles and the blower.

Details of the combination heel sander and heel breaster 59 on spindle 39 are shown in Fig. 7. As illustrated, spindle 39 is formed with an extension 221 of reduced diameter so as to have an annular shoulder 223 spaced from its free end. A sleeve 225 is fixed upon extension 221 as by set screws 227 with its inner end engaging the shoulder. Spindle 39 and sleeve 225 constitute a cantilevered arbor extending outward from the bearing housing 35 for the spindle. Sleeve 225 is of such length as to extend beyond the free end of the extension 221. It is formed adjacent its inner end with a flange 229 having a conical wedge 231 which converges toward the outer free end of the sleeve. A collar 233 slidable on the sleeve has a conical wedge 235 which converges away from the free end of the sleeve. Between flange 229 and collar 233 is an annular elastic ring 237 of rubber or the like, fitted upon the sleeve with its central aperture countersunk for reception of the opposed wedges 231 and 235. A nut 239 is threaded upon the outer end of the sleeve backing up the collar.

This arrangement is such that nut 239 may be threaded up on the sleeve to slide collar 233 toward the flange 229, thereby axially to compress the elastic ring 237 and radially to expand it to increase its diameter. Radial expansion of the ring is also facilitated by the wedging action of wedges 231 and 235 upon the ring. The ring 237 is expanded within an endless band 241 of an abrasive web, such as sandpaper, to form a heel sander 243. The band 241 is expanded to circular form and gripped in driving relation by the expanded ring 237.

The heel breaster, generally designated 245, comprises a conical mandrel 246 including a stud 247 which is threaded into the end of sleeve 225 projecting beyond the free end of spindle extension 221. Stud 247 is formed adjacent its threaded end with a conical head 249 converging toward the threaded portion and a stem 251 extending outward from the head. On stem 251 is fixed a conical resilient core 253 of rubber or the like, the conical surface of which is a continuation of the conical surface of head 249. A developed blank 255 of abrasive web, such as sandpaper, or a preformed hollow conic frustum of abrasive web is fitted upon the conical surface defined by the core 253 and the head 249. The inner end portion of the web is clamped between the head 249 and the conic wall of a countersunk aperture formed in a cap 257 fixed on the outer end of the sleeve 225.

The diameter of the outer end of the heel breaster 245 is less than the diameter of the abrasive band 241 of the heel sander 243 so that the latter may be removed and replaced over the end of the tool without removing the heel breaster. To remove the band 241, nut 239 is backed off to release the compression on elastic ring 237, whereupon the ring contracts radially to release the band. To replace the abrasive blank 255 of the heel breaster, the conical mandrel 246 is unthreaded from the sleeve, a new blank 255 fitted thereon, and the mandrel is threaded back into the end of the sleeve to clamp the inner end portion of the blank between head 249 and the cap 257.

Figs. 8–10 illustrate an expansible mandrel for bottom sander 61, particularly adapted for quick replacement of abrasive bands used thereon. As shown, the bottom sander spindle 41 is formed with an extension 261 of reduced diameter so as to have an annular shoulder 263 spaced from its free end. A sleeve 265 having an outer conical wedging surface is fixed upon extension 261 as by set screws 267 with its inner end engaging the shoulder. The conical surface of the sleeve converges away from the spindle. Fixed by a taper pin 268 within the end of the sleeve which projects beyond extension 261 is a stud 269 formed with a head providing an outwardly facing shoulder 271. The stud is coaxial with the spindle 41, and its outer end, which extends out of the sleeve, is threaded. Spindle 41, sleeve 265 and stud 269 constitute a cantilevered arbor extending outward from the bearing housing 35 for the spindle. An annular, resilient expansion member, generally designated 273, is mounted for axial sliding movement with respect to conical sleeve 265 and is adapted to be expanded radially by wedging action when moved axially inward to expand an elastic cylindrical ring or sleeve 275 into gripping engagement with a band 277 of an abrasive web, such as sandpaper.

Expansion member 273 comprises a unitary spring ring capable of substantially uniform radial expansion and contraction for variation of its diameter. It includes an annular series of flat, wedge-shaped fingers 279 which lie in generally radial planes and extend axially with respect to conical sleeve 265. The fingers are widest at their axially outer ends 280, are provided with inwardly facing shoulders 281 adjacent said ends, and taper in width toward their axially inner ends 282. The radially outer edges 283 of the fingers lie in a cylindrical surface and engage the interior of the elastic cylindrical ring 275. The radially inner tapering edges 285 of the fingers lie in a conical surface in engagement with conical sleeve 265. Pairs of adjacent fingers are alternately connected at their axially outer ends 280 by webs 287 and at their axially inner ends 282 by webs 289, webs 287 being annularly staggered with respect to webs 289.

A nut 291 threaded on the outer end of stud 269 backs up the expansion member 273. The expansion member is biased axially outward by

a coil spring 293 surrounding the stud and reacting from shoulder 271 of the stud against shoulders 281 of the fingers 279 so that webs 287 of the member 273 engage the nut. The nut normally is threaded up on the stud to slide expansion member 273 sufficiently inward to cause it to expand radially by wedging action of conical sleeve 285, thus to expand elastic sleeve 275 into gripping engagement with the band 277 of abrasive web. To remove the abrasive band, nut 291 is backed off. Spring 293 moves expansion member axially outward, whereupon it contracts radially to release the band, which may then be removed over the outer end of the mandrel. A new band may then be placed on the mandrel and the nut threaded up to expand member 273 and sleeve 275 thus to grip the band.

Fig. 11 illustrates an expansible mandrel for heel sander 69 on spindle 49. This is similar to the heel sander mandrel construction of the combination heel sander and heel breaster 59. As shown, spindle 49 is formed with an extension 301 of reduced diameter so as to have an annular shoulder 303 spaced from its free end. A sleeve 305 is fixed upon extension 301 as by set screws 307 with its inner end engaging the shoulder. Spindle 49 and sleeve 305 constitute a cantilevered arbor extending outward from the bearing housing 35 for the spindle. The sleeve is formed adjacent its inner end with a flange 309 having a conical wedge 311 which converges toward the outer end of the sleeve. A collar 313 slidable on the sleeve has a conical wedge 315 which converges away from the outer end of the sleeve. Between flange 309 and collar 313 is an annular elastic ring 317 of rubber or the like, fitted upon the sleeve with its central aperture countersunk for reception of the opposed wedges 311 and 315. A nut 319 is threaded upon the outer end of the sleeve backing up the collar. The nut is threaded up on the sleeve to expand the elastic ring within an endless band 321 of an abrasive web. Operation is the same as set forth in the above description of heel sander 243.

The above-described tools are particularly useful upon the shoe-finishing or repairing machine of this invention, since they are particularly adapted for use upon the cantilevered spindles of the machine. They simplify removal and replacement of the abrasive webs, since the webs may be removed and replaced over the ends of the spindles without disassembling parts of the machine.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. In apparatus of the class described, a movable carriage having a plurality of rotary shoe-finishing tool spindles journalled therein, said carriage being movable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, drive means cooperable with the selected spindle in said working position for driving it, and dust-collecting means movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles to permit movement of the carriage.

2. In apparatus of the class described, a movable carriage having a plurality of rotary shoe-finishing tool spindles journalled therein, said carriage being movable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, drive means cooperable with the selected spindle in said working position for driving it, dust-collecting means movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles to permit movement of the carriage, and means for maintaining said dust-collecting means in rectracted position when certain spindles are in said working position.

3. In apparatus of the class described, a turret, a plurality of rotary shoe-finishing tool spindles journalled at spaced intervals around said turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, drive means cooperable with the selected spindle in said working position for driving it, and dust-collecting means movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles to permit rotation of the turret.

4. In apparatus of the class described, a turret, a plurality of rotary shoe-finishing tool spindles journalled at spaced intervals around said turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, drive means cooperable with the selected spindle in said working position for driving it, dust-collecting means movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles to permit rotation of the turret, and means for maintaining said dust-collecting means in retracted position when certain spindles are in said working position.

5. In apparatus of the class described, a turret, a plurality of rotary shoe-finishing tool spindles journalled at spaced intervals around said turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, means for latching said turret in any one of its indexed positions, drive means releasably engageable with the selected spindle in said working position for driving it, dust-collecting means movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles, and means for concurrently releasing said latch means and drive means and moving said dust-collecting means to retracted position to permit rotation of the turret.

6. In apparatus of the class described, a turret, a plurality of rotary shoe-finishing tool spindles journalled at spaced intervals around said turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may

be applied to the tool, means for latching said turret in any one of its indexed positions, drive means releasably engageable with the selected spindle in said working position for driving it, dust-collecting means movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles, means for concurrently releasing said latch means and drive means and moving said dust-collecting means to retracted position to permit rotation of the turret, and means controlled by said turret for maintaining said dust-collecting means in retracted position when certain spindles are in said working position.

7. In apparatus of the class described, a turret, a plurality of rotary shoe-finishing tool spindles journalled at spaced intervals around said turret, each of said spindles having a clutch element thereon adapted to be driven, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, means for latching said turret in any one of its indexed positions, a shiftable driving clutch element releasably engageable with the driven clutch element of the selected spindle in said working position for driving it, a dust-collecting hood movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles, and means movable by an operator for concurrently releasing said latch means, shifting said driving clutch element out of engagement with a spindle clutch element and moving said hood to retracted position to permit rotation of said turret.

8. In apparatus of the class described, a turret, a plurality of rotary shoe-finishing tool spindles journalled at spaced intervals around said turret, each of said spindles having a clutch element thereon adapted to be driven, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position wherein work may be applied to the tool, means for latching said turret in any one of its indexed positions, a shiftable driving clutch element releasably engageable with the driven clutch element of the selected spindle in said working position for driving it, a dust-collecting hood movable between a dust-collecting position with respect to a spindle in said working position and a retracted position clearing all the spindles, means movable by an operator for concurrently releasing said latch means, shifting said driving clutch element out of engagement with a spindle clutch element and moving said hood to retracted position to permit rotation of said turret, and cam means controlled by said turret for maintaining said hood in retracted position when certain spindles are in said working position.

9. A shoe-finishing or repairing machine comprising a rotatable shaft, a pair of axially spaced turrets fixed on said shaft, a plurality of spindles journalled at spaced intervals around each turret on axes parallel to and equidistant from the axis of said shaft, each spindle on one turret being axially aligned with a spindle on the other, each spindle extending axially outward from its respective turret and carrying a shoe-finishing tool on its axially outer end, said turrets being conjointly rotatable between a number of indexed positions corresponding to the number of spindles on a turret to move a selected pair of aligned spindles and the tools thereon to a working position, and drive means located between said turrets cooperable with the selected pair of spindles in working position for driving them.

10. A shoe-finishing or repairing machine comprising a rotatable shaft, a pair of axially spaced turrets fixed on said shaft, a plurality of spindles journalled at spaced intervals around each turret on axes parallel to and equidistant from the axis of said shaft, each spindle on one turret being axially aligned with a spindle on the other, each spindle carrying a shoe-finishing tool on the outside of, and a clutch element adapted to be driven to rotate the spindle on the inside of its respective turret, said turrets being conjointly rotatable between a number of indexed positions corresponding to the number of spindles on a turret to move a selected pair of aligned spindles and the tools thereon to a working position, means for latching the turrets in any one of their indexed positions, shiftable driving clutch elements releasably engageable with the driven clutch elements of the selected pair of spindles in working position for driving them, and means for concurrently releasing said latch means and shifting said driving clutch elements out of engagement with the spindle clutch elements to permit rotation of the turret.

11. In apparatus of the class described, a base, a turret journalled for rotation on said base, spindles journalled in said turret on axes parallel to and equidistant from the turret axis, each spindle carrying a shoe-finishing tool on one side of said turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position, drive means carried by the base and cooperable with the selected spindle in working position for driving it, and a dust-collecting hood pivoted on said base for swinging movement about an axis transverse to the turret axis between a dust-collecting position with respect to a tool in working position and a retracted position clearing all the tools.

12. In apparatus of the class described, a base, a turret journalled for rotation on said base, spindles journalled in said turret on axes parallel to and equidistant from the turret axis, each spindle carrying a shoe-finishing tool on one side and a clutch element adapted to be driven for rotating the spindle on the other side of the turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position, means for latching said turret in any one of its indexed positions, a shiftable driving clutch element carried by the base releasably engageable with the driven clutch element of the selected spindle in working position for driving it, a dust-collecting hood pivoted on said base for swinging movement about an axis transverse to the turret axis between a dust-collecting position with respect to a tool in working position and a retracted position clearing all the tools, and means for concurrently releasing said latch means, shifting said driving clutch element out of engagement with a spindle clutch element and swinging said hood to retracted position.

13. In apparatus of the class described, a base, a turret journalled for rotation on said base, spindles journalled in said turret on axes parallel to and equidistant from the turret axis,

each spindle carrying a shoe-finishing tool on one side and a clutch element adapted to be driven for rotating the spindle on the other side of the turret, said turret being rotatable between a number of indexed positions corresponding to the number of spindles to move a selected spindle and tool thereon to a working position, means for latching said turret in any one of its indexed positions, a shiftable driving clutch element carried by the base releasably engageable with the driven clutch element of the selected spindle in working position for driving it, a dust-collecting hood pivoted on said base for swinging movement about an axis transverse to the turret axis between a dust-collecting position with respect to a tool in working position and a retracted position clearing the tools, means for concurrently releasing said latch means, shifting said clutch element out of engagement with a spindle clutch element and swinging said hood to retracted position, and means responsive to the indexed position of said turret for maintaining said hood in retracted position when certain spindles and tools are in working position.

14. In apparatus of the class described, a housing enclosing a blower, a turret journalled for rotation on said housing, spindles journalled in said turret carrying shoe-finishing tools on one side thereof, said turret being rotatable to various indexed positions wherein a selected spindle is adapted to be driven, a dust-collecting hood mounted on said housing for movement between a dust-collecting position over the tool on the driven spindle and a retracted position clearing all the tools, and a flexible conduit connecting the hood and the blower.

15. In apparatus of the class described, a base, a turret journalled for rotation on said base, spindles journalled in said turret carrying shoe-finishing tools on one side and driven clutch elements on the other, said turret being rotatable to various indexed positions wherein a selected spindle and tool are in a working position at the front of said base, means for latching the turret in any one of said indexed positions, a shiftable driving clutch element carried by said base releasably engageable with the driven clutch element of the spindle in working position, a dust-collecting hood mounted on said base for movement between a dust-collecting position over the tool in working position and a retracted position clearing all the tools, a pedal, and linkages operable by said pedal concurrently to release said latch means, shift said driving clutch element out of engagement with a driven clutch element and move said hood to retracted position.

16. In apparatus of the class described, a base, a turret journalled for rotation on said base, spindles journalled in said turret carrying shoe-finishing tools on one side and driven clutch elements on the other, said turret being rotatable to various indexed positions wherein a selected spindle and tool are in a working position at the front of said base, means for latching the turret in any one of said indexed positions, a shiftable driving clutch element carried by said base releasably engageable with the driven clutch element of the spindle in working position, a dust-collecting hood mounted on said base for movement between a dust-collecting position over the tool in working position and a retracted position clearing all the tools, a pedal, linkages operable by said pedal concurrently to release said latch means, shift said driving clutch element out of engagement with a driven clutch element and move said hood to retracted position, a cam rotatable with said turret, and means controlled by said cam for maintaining said hood in retracted position when certain spindles are in working position, there being a lost-motion connection between the pedal and the hood-operating linkage to permit latching of the turret and engagement of the clutch elements when the hood is maintained in retracted position.

17. A shoe-finishing or repairing machine comprising a rotatable shaft, a pair of axially spaced turrets fixed on said shaft, a plurality of spindles journalled at spaced intervals around each turret on axes parallel to and equidistant from the axis of said shaft, each spindle on one turret being axially aligned with a spindle on the other, each spindle extending axially outward from its respective turret and carrying a shoe-finishing tool on its axially outer end, said turrets being conjointly rotatable between a number of indexed positions corresponding to the number of spindles on a turret to move a selected pair of aligned spindles and the tools thereon to a working position, and drive means cooperable with the selected pair of spindles in working position for driving them.

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