



April 3, 1956

Filed April 10, 1953

D. N. WAYNE  
SURFACE CLEANING APPARATUS, INCLUDING  
DISCARDABLE REVOLVABLE HEAD

2,740,151

3 Sheets-Sheet 2

Fig. 2

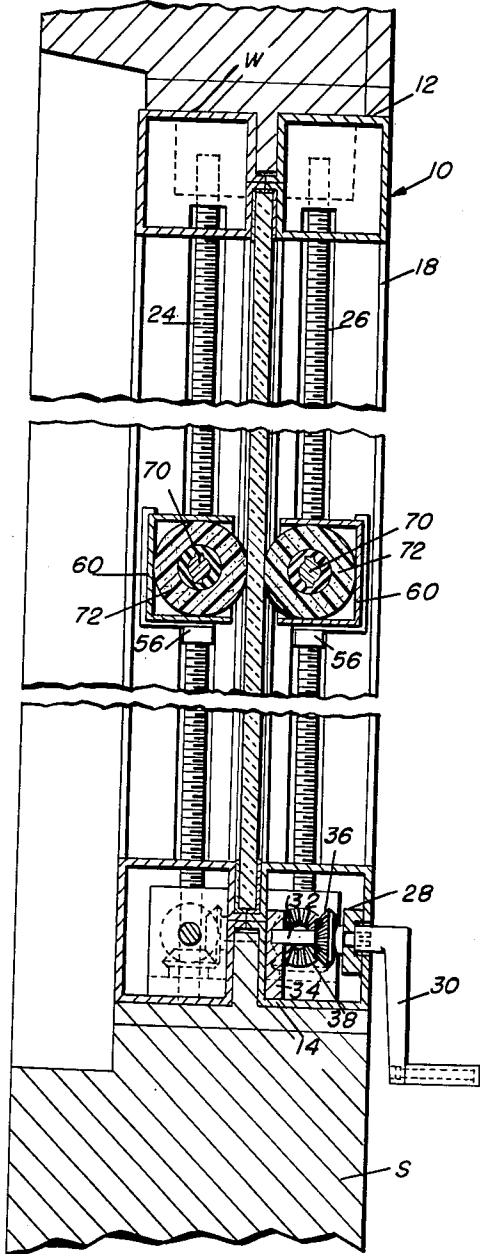


Fig. 3

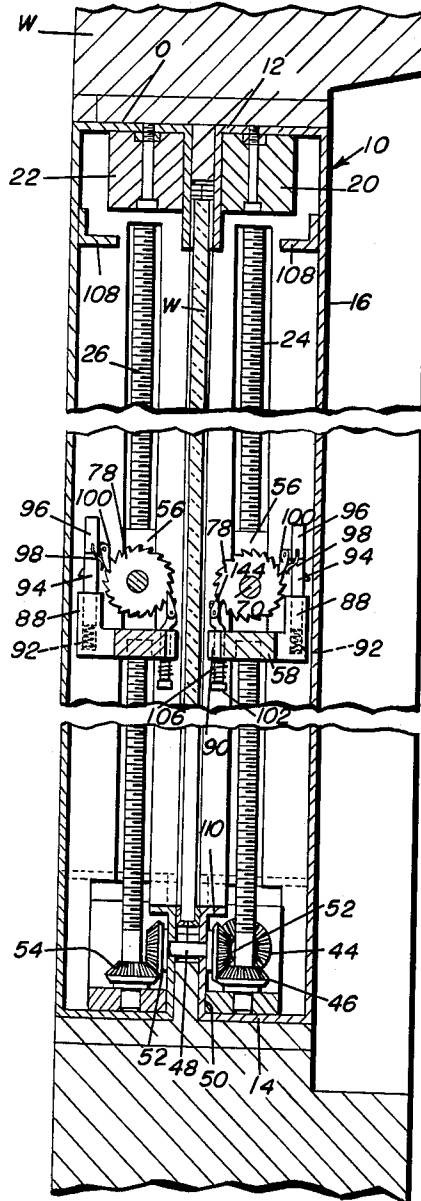
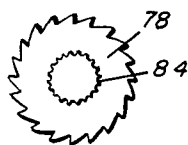


Fig. 8



Douglas N. Wayne  
INVENTOR.

BY *Clarence A. O'Brien*  
and *Harvey R. Jacobson*  
Attorneys

April 3, 1956

D. N. WAYNE  
SURFACE CLEANING APPARATUS, INCLUDING  
DISCARDABLE REVOLVABLE HEAD

2,740,151

Filed April 10, 1953

3 Sheets-Sheet 3

Fig. 4

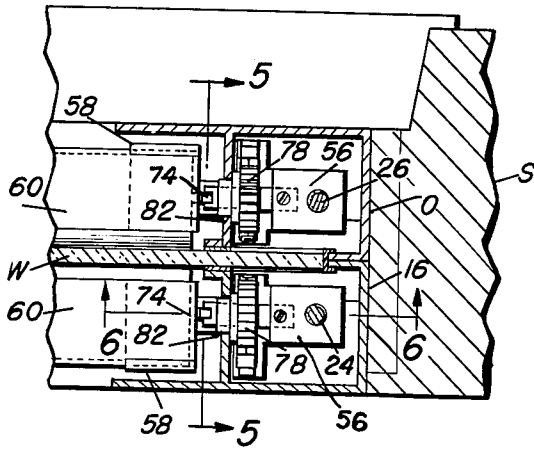


Fig. 5

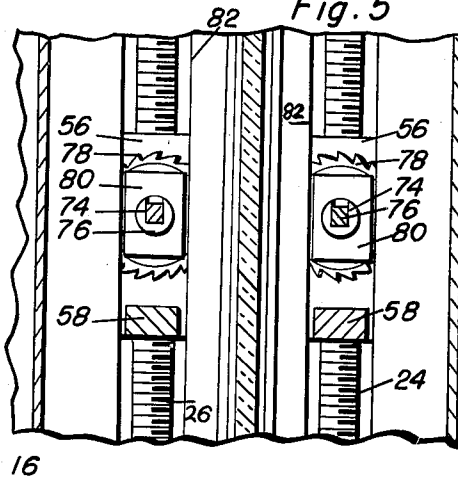


Fig. 7

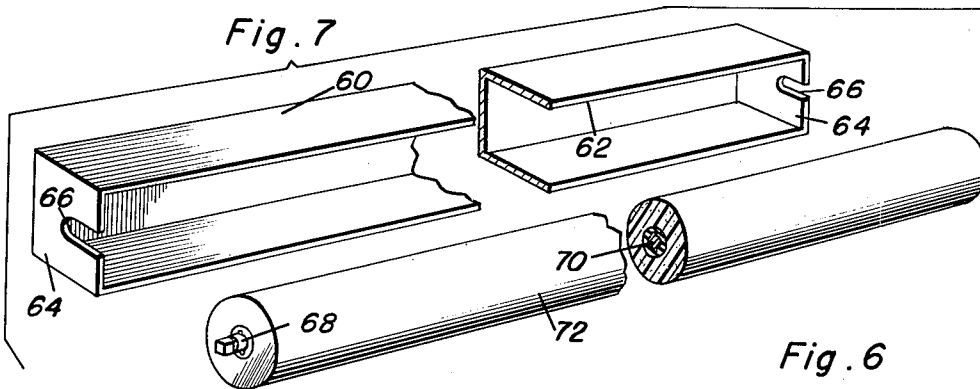


Fig. 6

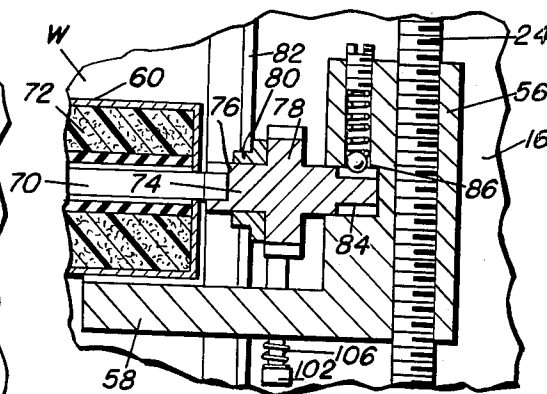
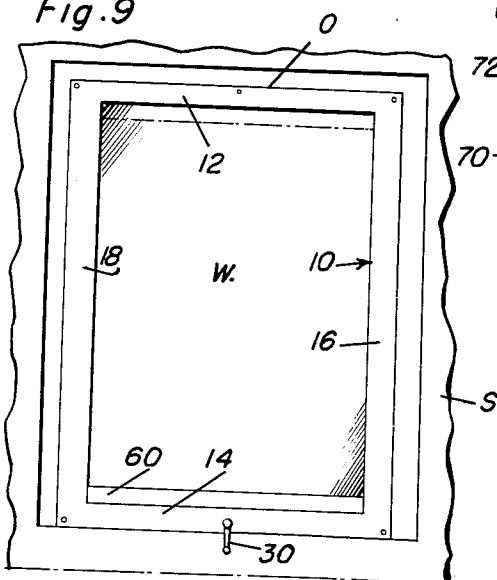


Fig. 9



Douglas N. Wayne  
INVENTOR.

BY *Almonce A. O'Brien*  
and *Harvey B. Jacobson*  
Attorneys

1

2,740,151

## SURFACE CLEANING APPARATUS INCLUDING DISCARDABLE REVOLVABLE HEAD

Douglas N. Wayne, New York, N. Y.

Application April 10, 1953, Serial No. 347,881

5 Claims. (Cl. 15—254)

This invention relates to new and useful improvements in surface cleaning apparatus and the primary object of the present invention is to provide a support movable across a surface that is to be cleaned and a chemically impregnated absorbent rotatable cleaning roller carried by the support and adapted to contact and clean the surface across which the support is movable.

Another important object of the present invention is to provide a surface cleaning apparatus that may be installed in existing window openings or constructed as a unitary part of a window, whereby all type of stationary and movable window sections may be quickly, readily, conveniently and safely cleaned.

Yet another object of the present invention is to provide a surface cleaning apparatus of the aforementioned character embodying novel and improved means for rotating the roller in a step by step manner as the support moves to the limits of its travel so that a clean surface of the roller will be moved against a surface to be cleaned.

A further object of the present invention is to provide a surface cleaning unit placeable within a window opening and involving crank operated feed screws that are rotated to move a support back and forth over a window or the like and a chemically impregnated roller carried by the support and adapted to press against a window facing the unit.

A still further aim of the present invention is to provide a surface cleaning apparatus that is extremely simple and practical in construction, strong and reliable in use, small and compact in structure, efficient and durable in operation, inexpensive to produce, install and service, and otherwise well adapted for the purposes for which the same is intended.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary front elevational view of the present invention and with parts broken away and shown in section, and further illustrating the invention disposed within a window opening of a wall structure;

Figure 2 is an enlarged vertical sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is an enlarged vertical sectional view taken substantially on the plane of section line 3—3 of Figure 1;

Figure 4 is an enlarged horizontal sectional view taken substantially on the plane of section line 4—4 of Figure 1;

Figure 5 is an enlarged fragmentary vertical sectional view taken substantially on the plane of section line 5—5 of Figure 4;

Figure 6 is an enlarged fragmentary vertical sectional view taken substantially on the plane of section line 6—6 of Figure 4;

Figure 7 is a fragmentary group perspective view of the surface cleaning roller and the support and housing therefor;

2

Figure 8 is a plan view of the roller carried ratchet used in the present invention; and,

Figure 9 is a front elevational view of the present invention installed within a display window opening.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a preferably extruded metal frame member which may be substantially rectangular in configuration to include upper and lower horizontal portions 12 and 14 joined by vertical portions 16 and 18.

The upper and lower portions 16 and 18 are hollow and have mounted therein by suitable fastening means inner and outer bearing elements 20 and 22. The inner bearing element 20 in the portions 12 and 14 rotatably support the upper and lower smooth surfaced cylindrical ends of an inner pair of vertical screws 24 which are located within the hollow vertical portions 16 and 18. The outer bearing elements 22 rotatably support the upper and lower smooth surfaced cylindrical ends of an outer pair of vertical screws 26 which are disposed within the vertical portions 16 and 18 of frame member 10.

The inner wall of the lower portion 14 fixedly supports a bearing 28 for the socketed end portion of a crank handle 30. A short shaft 32 rotatably carried by a bearing 34 fixed in portion 14 and secured within the socketed end portion of crank handle 30 fixedly supports a beveled drive gear 36 that meshes with facing beveled gears 38 and 40 on coaxial horizontal shafts 42, 42' rotatably supported by bearings 43 in portion 14. The ends of shafts 42, 42' carry beveled gears 44 that mesh with complementary beveled gears 46 fixed on the lower ends of screws 24, whereby the crank handle may be employed for rotating screws 23 as a unit.

Short connecting drive shafts 48 are rotatably supported by bearing-forming portions 50 of frame member 10 which are disposed within the juncture between portions 14 and 16, 18 and carry beveled gears 52 at their ends which mesh with the gears 46 and beveled gears 54 at the lower ends of screws 26, so that the screws 26 will be rotated in conjunction with the screws 24.

An internally threaded sleeve or traveling member 56 is receivably engaged for vertical movement upon each of the screws 24 and 26. These sleeves 56 are formed with horizontally projecting seat-forming flanges 58 that removably support the ends of housings 60 having open facing sides 62. Two housings 60 are employed, there being one housing between the flanges 58 of the sleeves in screws 24 and a second housing between the flanges of the sleeves on screws 26.

The end walls 64 of the housings 60 are provided with horizontal slots 66 which rotatably support the cylindrical end portions 68 of supporting shafts 70 for chemically impregnated resilient, absorbent, rollers 72 that are keyed to the shafts. These rollers may be suitably covered by a permeable sheet of material non-abrasive to polished or glassed surfaces.

The multisided end portions 74 of shafts 70 are engaged within complementary sockets 76 in ratchets 78. Bearings 80 for the hubs of ratchets 78 are vertically slidably received in slots 82 in the portions 16 and 18 of frame member 10. The circumferentially notched ends 84 of ratchets 78 are engaged by spring pressed balls 86 carried by sleeves 56 (Figure 6) to retain the ratchets 78 and hence shafts 70 in a selected rotated position.

Flanged portions or flanges 58 are each formed with a vertical tubular portion 88 and a vertical aperture 90 which are located on opposite sides of shafts 70. The tubular portions 88 are closed at their lower ends and accommodate springs 92 that urge plungers 94 upwardly. The upper pivoted sections 96 of plungers 94 are yieldingly retained by springs 98 coaxial with the lower sec-

tions of the plungers and pivotally support pawls 100 that engage the ratchets 78, so that when plungers 74 are depressed, the pawls 100 will rotate the shafts 70 and hence the rollers 72 slightly.

Apertures 90 slidably carry lower plungers 102 whose upper offset ends pivotally support pawls 144 that engage ratchets 78. The plungers 102 are spring urged downwardly by coil spring 106, so that when the plungers 102 are moved upwardly relative to the flanges 58, the ratchets 78 will be rotated slightly and hence shafts 70 and rollers 72.

In practical use of the present invention, the frame member 10 may be mounted by suitable fastening means within a window opening O in a wall structure S or be formed as part of a window frame. However, the window W or surface to be cleaned will be located between the screws 24, 26 and the rollers 72 carried by these screws so that the portions of the rollers that project outwardly from the open sides 62 of the housings 60 will engage and contact both faces of the sash glass W.

As the crank handle 30 is rotated, the housings 60 will travel vertically and the rollers 72 will ride against and clean the surface W. When the housings 60 approach the upper portion 12 they will engage abutments 108 to depress the plungers 94 and cause a new, clean, surface of rollers 72 to contact surface W. Lowering of the housings 60 by the crank handle 30 will cause plungers 102 to engage stop and abutment flanges 110 of portions 14 for the purpose of again rotating rollers 72 to expose a clean surface to the surface W. The detents 86 will retain the rollers 72 in their rotated position and hold the rollers against back rotation from frictional engagement with surface W.

A suitable cleaning chemical of known composition is applied to the rollers either by brushing the same on the rollers, spraying the rollers or dipping the rollers in this cleaning solution. The rollers are relatively inexpensive and may be discarded when their peripheries are completely soiled, however, the rollers are removable from their supporting shafts 70 so that the latter can be reused. By lifting upwardly upon the rollers, the ends of shafts 70 will be disengaged from the sockets 76 so that the rollers may be quickly and readily displaced from the supports 56, 58, 80.

What is claimed as new is as follows:

1. In a window cleaning apparatus including a frame having upper and lower portions, a pair of spaced parallel screws rotatably supported by said portions, a horizontally disposed chemically impregnated roller extending between said screws, means vertically adjustably carried by

said screws and supporting said roller, and means operatively engaged with said roller and actuated upon engagement with one of said portions for rotating the roller in a step by step manner.

2. In a window cleaning apparatus including a frame having upper and lower portions, a pair of spaced parallel screws rotatably supported by said portions, a horizontally disposed chemically impregnated roller extending between said screws, means vertically adjustably carried by said screws and supporting said roller, said roller having a supporting shaft, a ratchet secured to said shaft, upper and lower spring urged plungers slidably carried by said roller supporting means and engageable with said upper and lower portions respectively, and a pawl carried by each plunger and engaging the ratchet to rotate the latter as the plungers are reciprocated upon engagement with said portions.

3. A window cleaning device comprising an open frame adapted to be mounted in a window opposite a window-pane and having vertical sides, a support extending horizontally in said frame between said sides, means in said frame operatively connected to said support to move the same vertically between upward and downward limits of movement, a horizontally disposed roller rotatably mounted on said support and adapted to engage said pane, means on said support operatively connected to said roller for operation to rotate the roller step by step, and means in said frame operatively engaged with the means on the support by vertical movement of the support in each limit of movement of the support, and disengaged from the means in the frame between limits of movement of the support.

4. A window cleaning device according to claim 3, and coating devices on the support and roller yieldingly restraining the roller against rotation between limits of movement of said support.

5. A window cleaning device according to claim 3, said means on the support operating said roller in one and the same direction in each limit of movement of the support.

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

##### UNITED STATES PATENTS

|           |         |               |
|-----------|---------|---------------|
| 612,896   | Dunn    | Oct. 25, 1898 |
| 954,158   | Artz    | Apr. 5, 1910  |
| 1,474,840 | Martin  | Nov. 20, 1923 |
| 1,633,479 | De Rosa | June 21, 1927 |
| 1,689,163 | Sukert  | Oct. 23, 1928 |
| 2,187,585 | Grigas  | Jan. 16, 1940 |
| 2,392,230 | Collins | Jan. 1, 1946  |