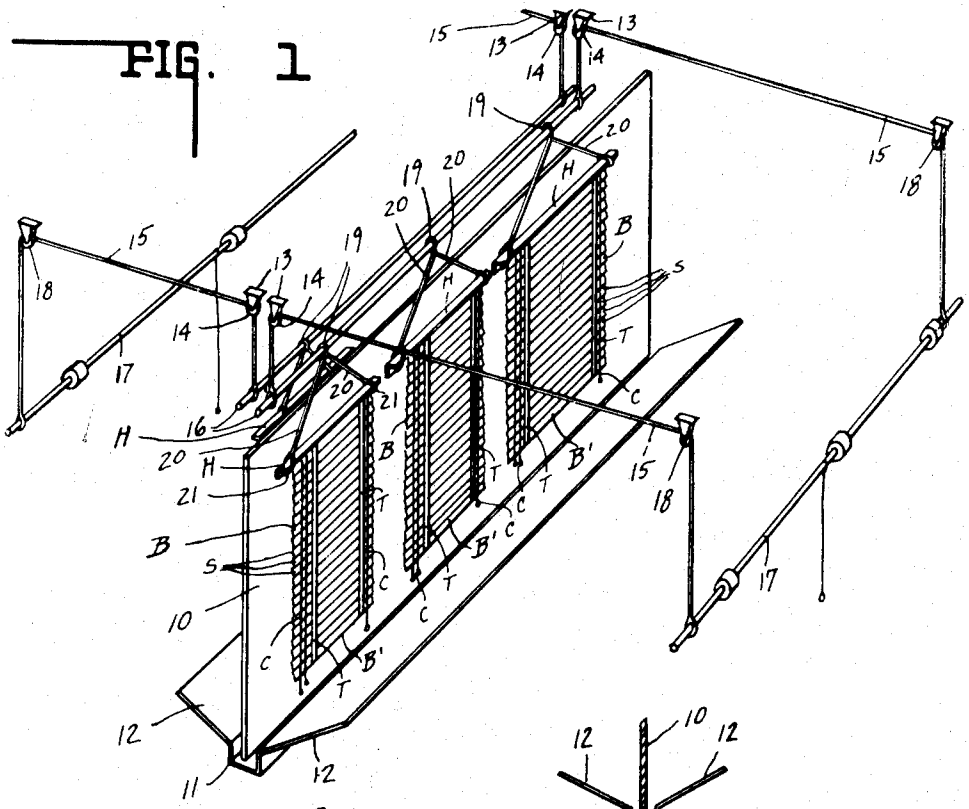
Jan 12, 1954 L. C. ROBINSON 2,665,698

VENETIAN BLIND CLEANING APPARATUS

Filed Feb. 23, 1949 2 Sheets-Sheet 1

FIG. 1



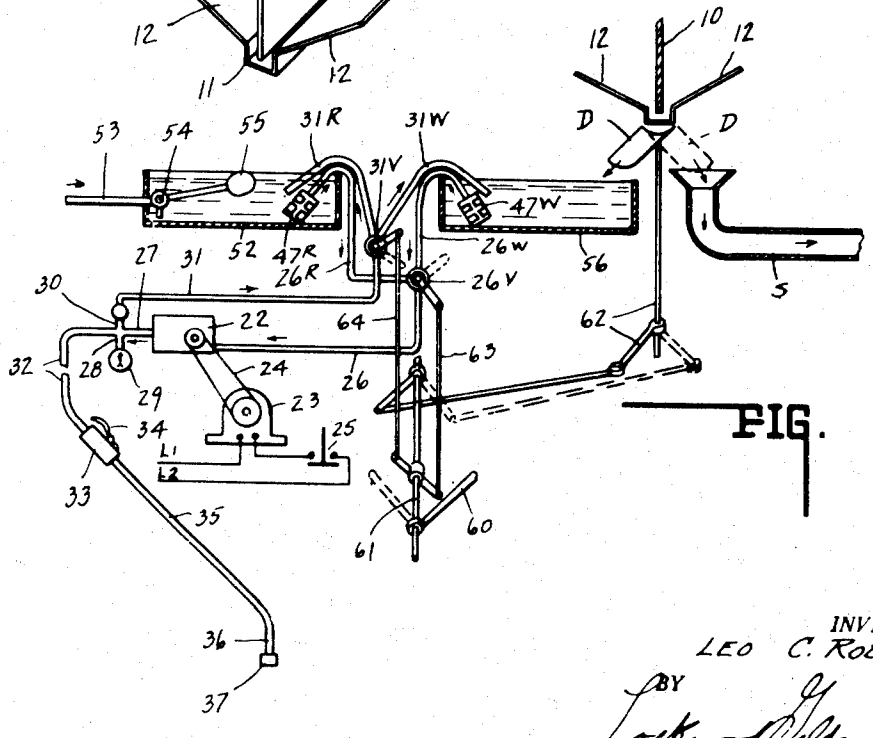


FIG. 2

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VENETIAN BLIND CLEANING APPARATUS

Filed Feb. 23, 1949 2 Sheets-Sheet 2

FIG. 3

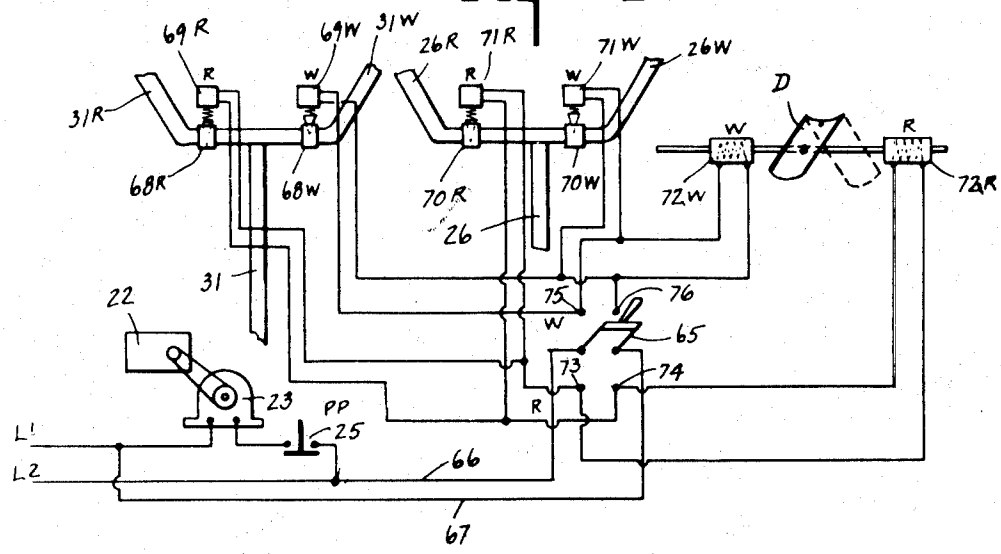


FIG. 4

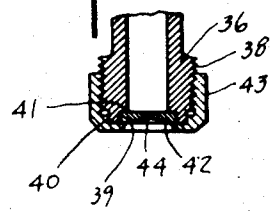


FIG. 5

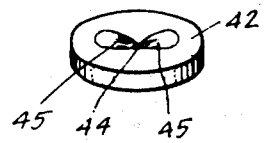


FIG. 6

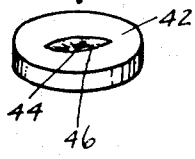


FIG. 7

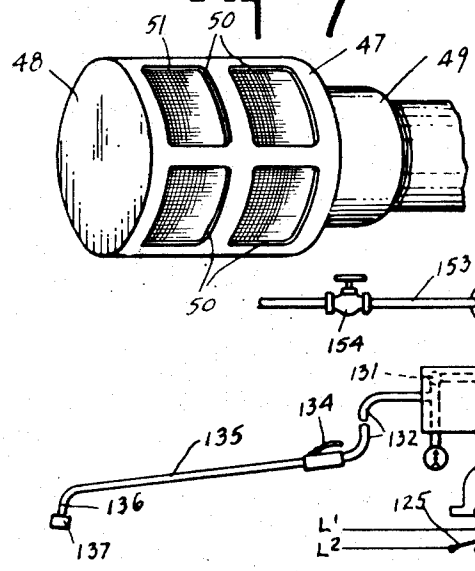
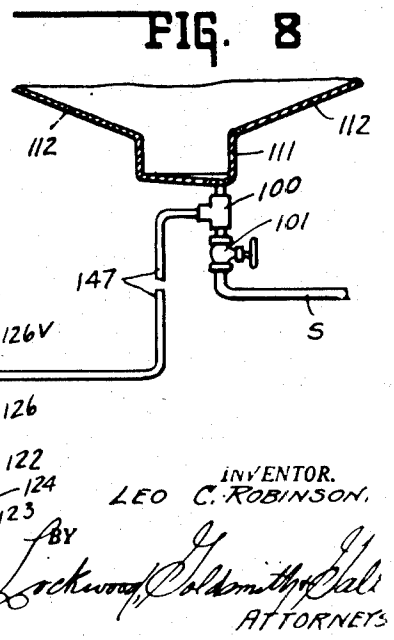


FIG. 8



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VENETIAN BLIND CLEANING APPARATUS

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Application February 23, 1949, Serial No. 77,878

1 Claim. (Cl. 134—88)

1

This invention relates to apparatus for cleaning Venetian blinds of wood, metal or plastic slat type, and other slat-like articles such as shutters, etc.

The chief object of this invention is to clean, without scrubbing or wiping, blinds and the like of the character aforesaid.

The chief feature of the present invention resides in cleaning primarily by pressurized cleansing and rinsing fluids.

The apparatus of this invention is capable of one man manipulation and extremely simple in character so that initial investment, subsequent maintenance and operating personnel costs are minimized.

Other objects and features will be set forth more fully hereinafter.

The present invention contemplates an elongated handle and spray device flexibly connected to a single motor driven pump adapted to selectively supply to the said device the cleaning solution and/or the rinse water.

Tapes, cords, head and bottom boards, etc., as well as the slats are all cleaned without the necessity of rubbing, wiping or scrubbing.

The full nature of the invention will be understood from the accompanying drawings and the following description and claim.

In the drawings:

Fig. 1 is a perspective semi-diagrammatic view of a dual unit embodiment of the invention.

Fig. 2 is a diagrammatic view of piping and like connections.

Fig. 3 is a wiring diagram of an automatic control system embodiment of the invention.

Fig. 4 is a central sectional view of the spray nozzle tip structure.

Fig. 5 is a perspective view of one side of the nozzle element.

Fig. 6 is a similar view of the other side thereof.

Fig. 7 is a perspective view of the suction head device.

Fig. 8 is a diagrammatic representation of a modified piping system of simplified form.

In Fig. 1 of the drawings 10 indicates a backstop of appreciable width and appreciable height. Same, however, herein terminates short of or slightly above the floor, so that a drain 11 may be disposed therebeneath. Extending outwardly and upwardly therefrom and on each side of the same are the wings 12.

In overhead relation and inwardly of the upward projection of the outer edges of said wings are the pulley supports 13 supporting pulleys 14 carrying cables 15. These are connected at

2

the ends, closest to the partition 10, to a light support such as a hollow tube 16 disposed lengthwise immediately contiguous to the partition. A suitable counter-balance in the form of springs, weights, or another tube 17 is connected to the other ends of the said cables 15, said other ends being supported by pulleys 18. Any other suitable adjustable holder may be employed.

Support 16 thus may be raised and lowered depending on the length of the blinds to be supported thereby. The number of shades so supported at any one time is determined by support length and blind width. The maximum length of blind to be accommodated is determined by the elevation of pulleys 14.

The blinds B include the usual slats S, tapes T, cords C and head and bottom members H and B' respectively. Each of said supports 16 has slidably supported thereon the loops 19 each of which includes a pair of depending portions 20, each of which in turn, terminates in a loop 21.

The loop ends are slipped over the head board H at opposite ends thereof and thus the shade is suspendingly supported by the support tube 16. When the latter has been elevated to dispose the extended blinds above the adjacent wing 12, the blind may be cleaned when the slats are disposed at about 45°. Then the blind is turned about on the loop 19, the length of portions 20 permitting such turning either to the right or left. The slats are again disposed at about 45°. Then the other side of the blind is cleaned as before.

Following cleaning of all blinds then on a support 16 on both sides they are rinsed from one side then turned over and again rinsed.

The blinds then can be drawn up and the support 16 lowered whereupon the cleaned and rinsed blinds are removed and otherwise hung up to dry in extended relation and with the slats in the intermediate or open position.

Herein, see Fig. 2, the apparatus and material for cleaning and rinsing the blinds includes a single motor driven pump 22 suitably driven by motor 23 through belt 24. The motor is controlled by an on-off switch 25.

The pump 22 includes an intake suck line 26 and a pressure discharge line 27, a gauge branch line 28 with pressure gauge 29 therein and a bypass relief branch line 30 with waste extension 31. This bypass is automatic in that when the pump is started it may run without line destruction even if pressure line 27 be closed. The pump may have a capacity sufficient to accommodate two or more cleansing and rinsing de-

vices. When all are in use the bypass is seldom operative. When but part of them are in use or all are cut off or closed down the relief bypass is effective.

A flexible hose 32 is connected to pressure line 27 at one end and its opposite end is connected to a valve numbered 33 having the manual operable handle 34. Extending from this valve member 33 is an elongated rigid tube 35 having its opposite end disposed angularly of the main body portion as indicated at 36. This angle is somewhere in the neighborhood of 135°.

This angle end terminates in a nozzle 37, see Fig. 4, which is formed as follows; the end of the portion 36 is threaded as at 38 and it is reduced interiorly and exteriorly as at 39 and 40, the former forming a seat 41 to accommodate an apertured disk 42, the latter being held by an open type cup 43 threaded on to the threaded portion 38 of the angular portion 36.

As shown in Figs. 5 and 6 the disk 42 includes a central aperture 44 and the inside is relieved as indicated at 45 and the outside includes a segmental relieved portion 46. The result is that the discharge under high pressure from this nozzle structure is in the form of a very fine spray having very great velocity.

The suck line 26 may be of flexible character and terminates in a screened intake, see Fig. 7, which comprises a suck head indicated generally by the numeral 47. Said head essentially is a cylinder closed at its free end 48 and its opposite end 49 is suitably connected to a threaded member terminating the suck line. The side wall of the cylinder is cut out as at 50 and the openings thus formed, exposing the interior of the cylinder, are closed by a screen or wire mesh 51, of from 100 to 150 to the inch. This screen material is usually copper or bronze.

A tank 52 is provided that preferably is connected to a source of water supply such as a city water supply 53 and a valve 54 controls the discharge of that supply to that tank. Such valve is controlled by a float structure 55. Thus when water is being taken from the tank and the water level drops therein, the float follows. This opens the valve permitting the city water supply to replenish water taken from the tank. The float rises and when the desired water level is attained, the valve cuts off the city supply.

Another tank 56 is provided which is a detergent tank. Both tanks, if desired, may be suitably drained. The detergent composition is placed in the tank 56 and stirred until dissolved or nearly dissolved. Then the suck head 47 is disposed in the detergent tank 56 and the waste line 31 from the pump is also disposed in the tank.

When the switch is closed the motor is started and the pump operates, sucking the detergent or cleansing solution through the suck head, then through the pump and wasting the same back to the detergent tank 56 if spray device valve 33 be closed. If the blinds have been disposed, as previously described and the pump is operating as described, the operator opens valve 33 and directs the detergent spray from nozzle 37 upon the tapes, cords, head and bottom boards and the slats of the several Venetian blinds.

It has been ascertained that when the gauge 29 indicates 300 p. s. i. at the pump, the pressure at the nozzle is approximately 275 p. s. i. but this pressure is not destructive to the blinds because of the finally divided condition of the spray. By virtue of this high pressure and the detergent solution employed, the grease, dust, dirt, etc. are all washed from the surface subjected to that spray. It might here be stated that the length of the tube 35 is about 3½ feet long and the nozzle 37 is disposed about six or eight inches from the surface to be cleaned, although it might be disposed at a slightly greater distance. Obviously that portion of the spray that does not impinge upon a blind or portion thereof will impinge upon the back stop 10 and drain downwardly. Such detergent solution as impinges upon the blind will also drain downwardly.

Preferably to prevent waste of the drainage from the back stop 10 and the blinds the former is collected by the drain 11 and wings 12 and returned to the detergent tank 56. Some foaming results due to this return and also due to the pump bypass operation, hence the employment of the suck head to prevent sucking of bubbles, suds and solids into the pump which would, if so taken into the pump, either damage the pump or air lock the same. It has been ascertained that the amount of detergent solution to be made up is sufficient for a day's or one-half day's use providing one man or multiple operation is employed and the drainage is returned to the detergent tank for recycling.

After the blinds have been cleaned as described, the motor may be stopped if desired, the waste line applied to tank 52, the suck line also applied thereto and the drain disassociated from the detergent tank so that the drain now will discharge to a sewer connection. Then the motor is started and in a few moments the system is cleared of detergent solution and clean water only is handled thereby. This clean water is then applied to the blinds and if necessary multiple rinsing is then effected. Then the motor is stopped and after they have sufficiently drained, the cleaned blinds are removed and dirty blinds supplied to the support for cleaning.

The foregoing describes the simplest form of apparatus and it will be obvious that the same can be handled by a workman of but little skill. It will also be noted that the angular disposition of the tip or nozzle 37 and the length of the handle 35 or tube supplying same is such that the operator in general can stand upright and reach blind portions above his head and to the right and left of him, as well as the blind portions disposed about ankle level.

Economical operation, it will be obvious, is to reuse or cycle the detergent solution which is drain collected and then returned to the detergent tank.

This simple apparatus previously described, requires the operator to shift not only the suck line and head but also the pump waste line from the detergent tank to the rinse water tank and vice versa. The simplest way to enable the operator to shift the lines simultaneously would be to tape or otherwise mechanically secure the suck head and the discharge end of the pump waste line together so that these two lines will be handled as a unit. Then all the operator has to do is stop the pump, make the shift from tank to tank and divert the drainage from the spray device either to the sewer or to the detergent tank as specified.

For fool proof operation it is contemplated that three controls be provided and these comprise an on and off switch for the motor and a waste control and a rinse control, the two latter being coordinated differentially, that is, one if off when

the other is on. Such controls therefore, only requires motor energization or cut off and operating the wash and rinse controls, for the desired washing and rinsing. Such controls may be of the interlocked type or may be of the electrically controlled type. The motor obviously is electrically controlled.

Reference will now be had to one embodiment of such automatically controlled structure.

In Fig. 2 the manual semi-automatic mechanical control system is illustrated. Motor 23 is supplied by line L–1 and L–2 controlled by the on and off push button 25. The waste line 31 includes branch 31W and the branch 31R. These two branches are controlled by a single 3-way valve 31V. The suck line 26 includes branch 26W and branch 26R and the junction is controlled by valve 26V. Suck heads 47W and 47R are disposed in the detergent and rinse tanks 56 and 53, respectively. The free ends of the waste lines 31W and 31R are similarly disposed in said tanks, respectively.

Herein there is diagrammatically illustrated a sewer drain S and disposed at the termination of drain 11 is a diverter D which may divert the drainage from drain 11 to the detergent tank 56 or to the sewer drain S.

Herein a handle 60 is mounted on a rock shaft 61 and this rock shaft is suitably connected by mechanism 62 to this diverter D. This shaft is also suitably connected as at 63 to the valve 26V. Similarly the valve 31V is connected by mechanism 64 to said rock shaft 61. When the handle 60 is disposed in the wash position the diverter D will be disposed as shown in full lines in Fig. 2, thus, returning the drainage to the detergent tank. At the same time valves 26V and 31V, two or three way valves as desired, are so positioned through the mechanisms 63 and 64 respectively, that the waste line 31W is in direct communication with waste line 31 and the suck line 26W is in direct communication with the suck line 26. The system is thus conditioned for washing when the motor switch is closed and the handle 60 is disposed as shown by the full lines.

When the handle 60 is disposed as shown by the dotted lines, the rock shaft 61 has actuated mechanisms 62, 63 and 64 to effect the following changes: The diverter D has now been shifted for discharge to the sewer S (see dotted lines) and no longer discharges to the tank 56. The waste line 31R is now in direct communication with the waste line 31 and the waste line 31W is cut off. The suck line 26R with suck head 47R are now in free communication with suck line 26 and suck head 47W and suck line 26W are now cut off therefrom. Thus, the system is conditioned for rinsing. The rinse water wastes to the sewer, thus preventing dilution of the detergent or cleansing solution.

Reference will now be had to Fig. 3 wherein an electric type control system is illustrated. The motor 23 is again supplied by lines L–1 and L–2 controlled by the on-off push button switch 25. Herein a two-way switch is provided and the two-way switch blades 65 thereof are connected by lines 66 and 67 to lines L–2 and L–1 respectively. Herein waste line 31 is provided with branches 31R and 31W as before.

Each of these branches is controlled by a valve, thus, the rinse waste line includes the normally closed solenoid valve designated by the numeral 68R and controlled by solenoid 69R. The wash water waste line 31W is similarly controlled by

the valve 68W in turn controlled by the solenoid 69W.

The suck line 26 includes the two branches 26R and 26W as before and disposed in each is a solenoid valve designated 70R and with solenoid 71R and valve 70W controlled by solenoid 71W respectively. Herein the diverter D is connected to the cores of the solenoids 72W and 72R.

The several solenoids designated with the R suffix are connected to the contacts 73 and 74 and the several relays or solenoids designated by the suffix W are connected to the contacts 75 and 76 of the two-way switch. Thus, when the two blades of switch 65 engage contacts 73—74, the system is conditioned for rinsing and when the contacts 65, as illustrated, engage the contacts 75 and 76 of said two-way switch, the W suffix relays are energized and the system is conditioned for washing.

Thus, the operator has only to actuate the motor control switch and dispose the switch 65 in position to close the same for washing or rinsing. The latter switch is diagrammatically illustrated for any suitable modification or variation thereof may be employed.

When it is desired, with either of the two last mentioned systems, it is not necessary to stop the pump to shift from rinse to wash or wash to rinse. The operator thus can have the pump run continuously while working, whether washing or rinsing, as the case may be. He would only stop the pump at such time as he might be applying blinds to be cleaned and removing cleaned blinds from the blind support previously described.

In the event that two men are available, one can perform the last mentioned operation and the other can perform the washing and rinsing operation. The operator who performs the latter operation then moves from one side of the partition to the other. If two operators are washing and rinsing, as has also been mentioned, it is obvious that both must wash at the same time and rinse at the same time, and by that is meant one cannot be washing while the other is rinsing.

In Fig. 8 there is disclosed one detergent tank 111, one valve controlled pressure water supply line 153, manually controlled at 154, a three-way valve 126V connected to said line and said tank at 147. The valve also connects by line 126 to a motor driven pump with adjustable internal bypass 131 included therein. The discharge line 132 from the pump terminates in the hand control 134 and spray nozzle structure 135—137.

In this simplified form the three-way valve 126V selectively connects the tank and line together for tank filling. Then it connects the tank and pump together for detergent supply to the nozzle. Then it connects the line and pump together for rinse purposes.

In this embodiment a single three-way valve 126V and a motor power switch is all that is required for operation. Preferaby the so-called drain collector 111—112 is utilized as the tank and it includes a valve controlled waste 100 which is normally closed at valve 101 during washing and open during rinsing. Hence recirculation of detergent is still utilized but a separate detergent tank is unnecessary.

It appears that 600 p. s. i. is the maximum safe pressure usable in this invention. Also it appears that 150 p. s. i. will spray clean substantially every household or office Venetian

blinds. For special blinds greater or lesser pressures may be required. The lower limit, especially for very light fragile slats. The reference to specific pressures is given by way of example only.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claim.

The invention claimed is:

A Venetian blind cleaning apparatus comprising a back stop, a drain disposed therebeneath, a Venetian blind support suspended in overhead relation in close proximity to said back stop and vertically adjustable for disposing the lower end of an extended Venetian blind above the drain, said support comprising a substantially horizontal elongated member disposed in a plane parallel to said back stop, a plurality of blind connecting means slidably carried by said member, each of said connecting means including a pair of equal length suspension elements terminating in a loop,

said loops being adapted for operative association with the ends of the headboard of a Venetian blind, and a high pressure spray discharge means adapted to discharge in close proximity to the blind a cleansing solution spray upon the blind at a pressure of not less than 150 p. s. i.

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