Nov. 29, 1960 A. REBERNAK ET AL 2,961,676

ANGULARLY-SUPPORTED SPONGE MOP

Filed June 20, 1955 3 Sheets-Sheet 1

Fig. 1

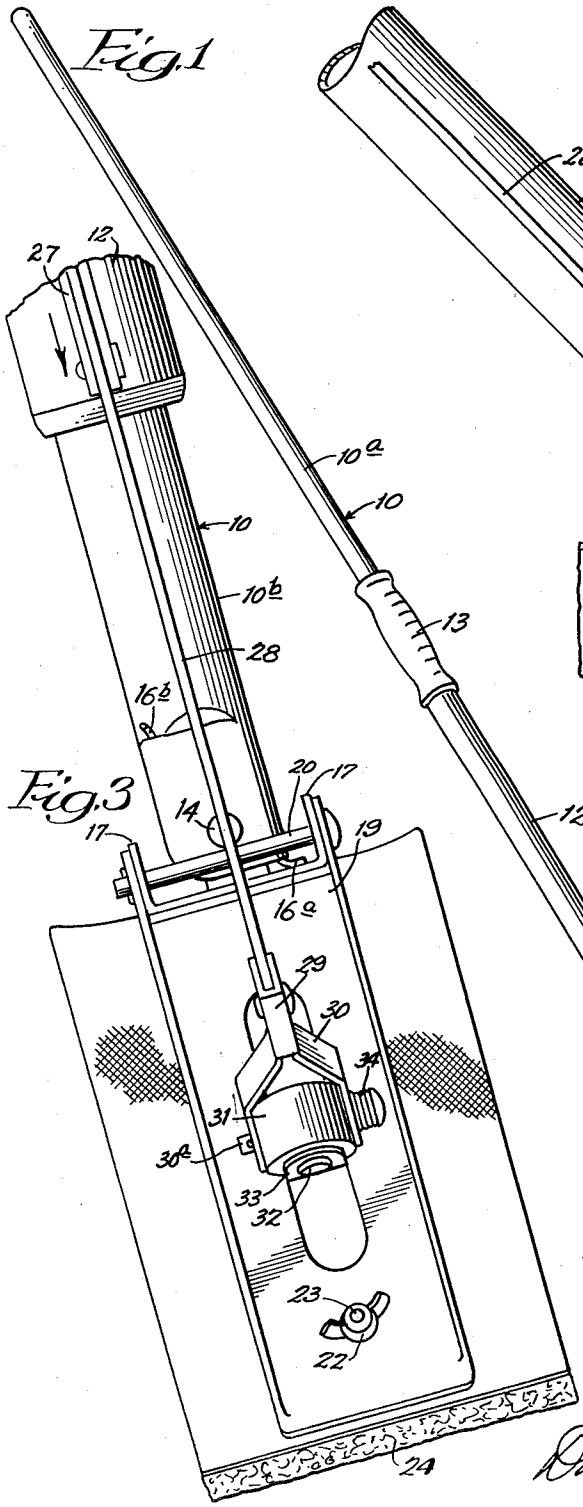


Fig. 2

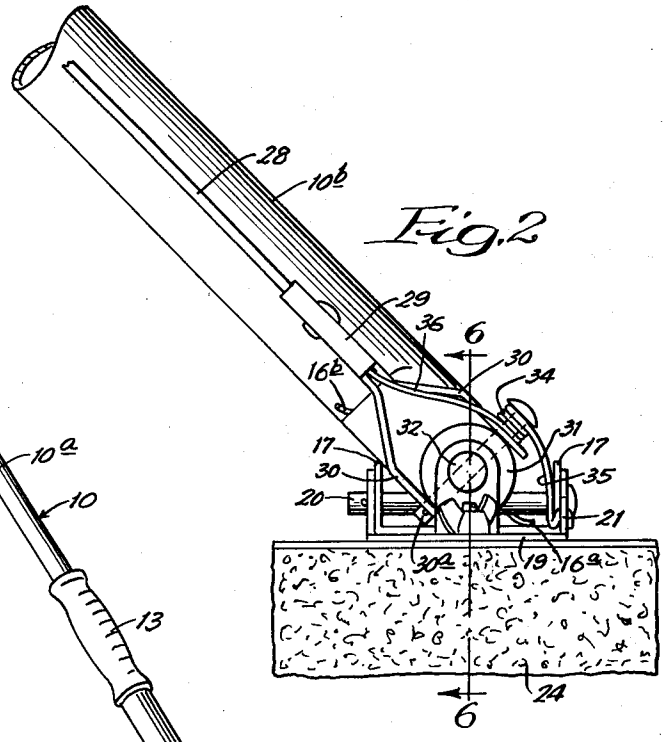
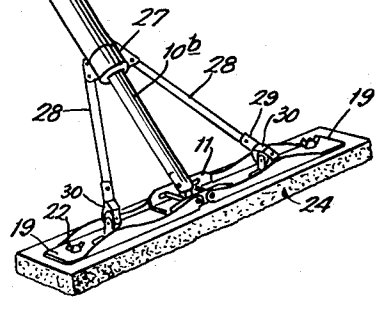


Fig. 3



INVENTORS:
Adolph Rebernak and
BY Eugene Chester Michaels
Dawson, Tilton & Graham
ATTORNEYS.

Nov. 29, 1960 A. REBERNAK ET AL 2,961,676

ANGULARLY-SUPPORTED SPONGE MOP

Filed June 20, 1955 3 Sheets-Sheet 2

Fig. 4

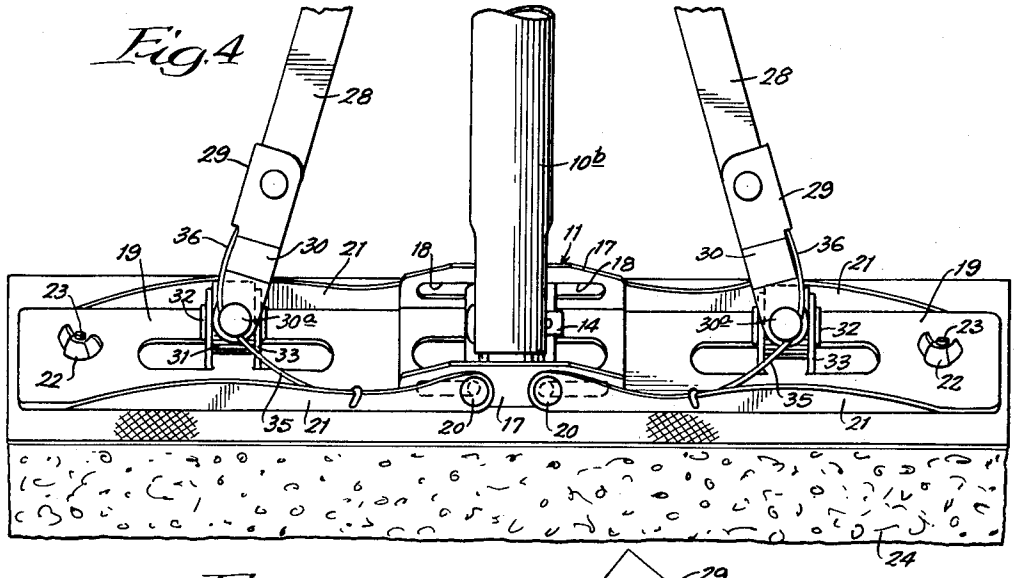


Fig. 5

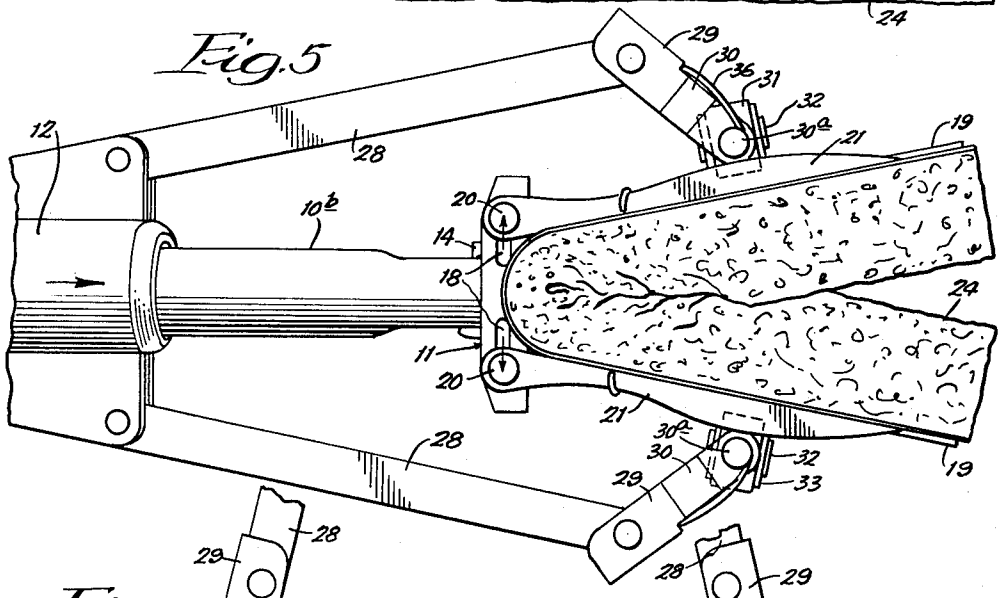
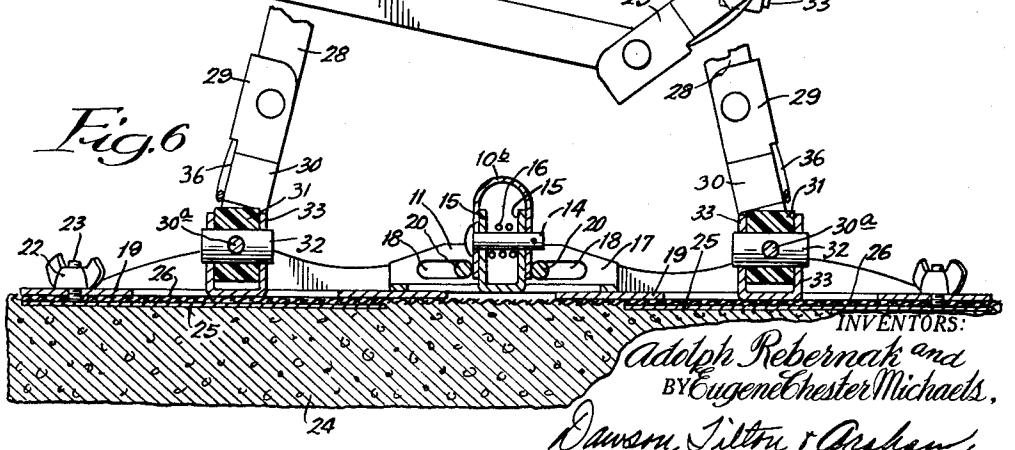


Fig. 6



INVENTORS:
Adolph Rebernak and
BY Eugene Chester Michaels,
Dawson, Tilton & Graham,
ATTORNEYS.

Nov. 29, 1960 A. REBERNAK ET AL 2,961,676

ANGULARLY-SUPPORTED SPONGE MOP

Filed June 20, 1955 3 Sheets-Sheet 3

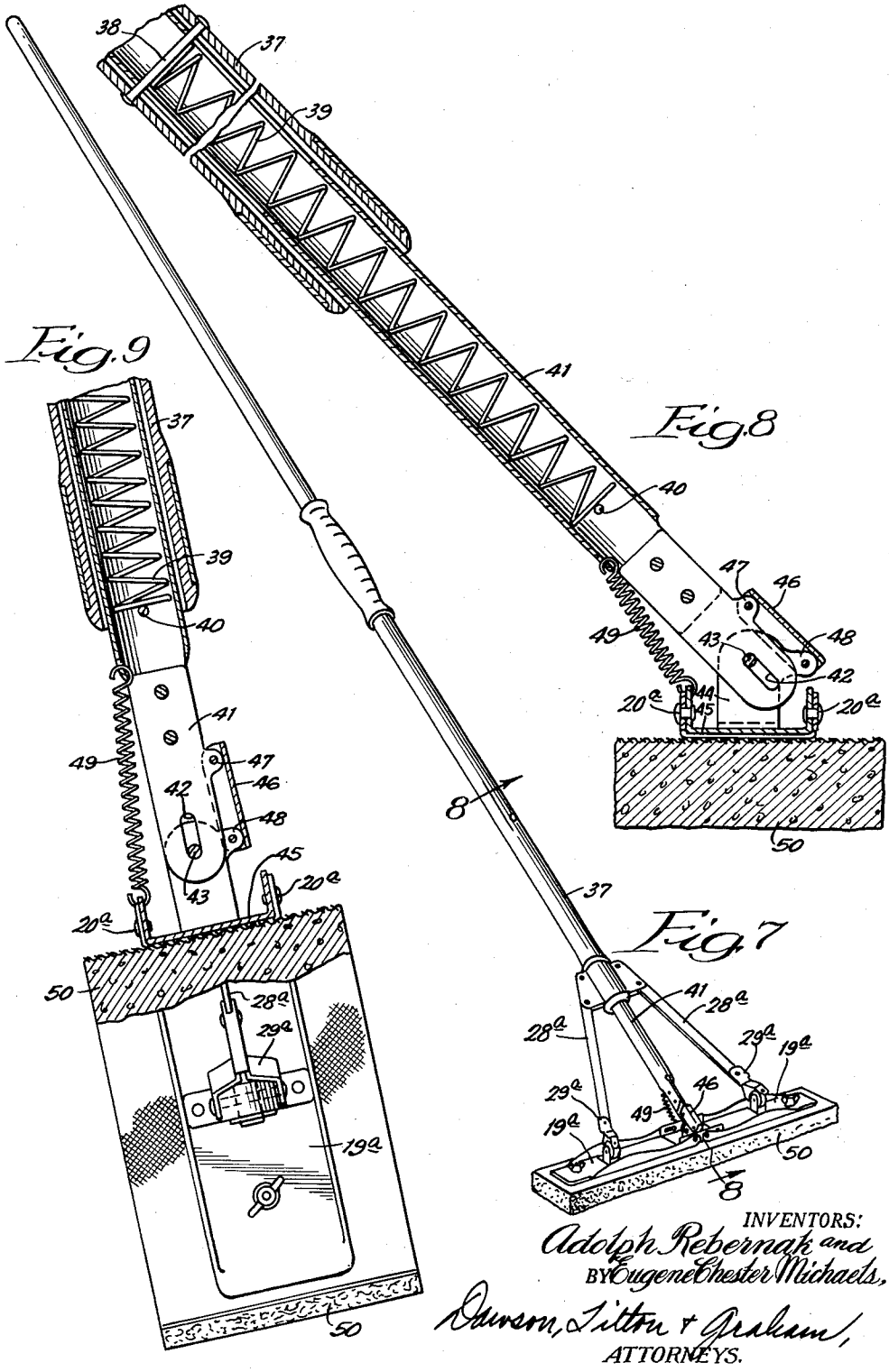


Fig. 8

Fig. 9

Fig. 7

INVENTORS:
Adolph Rebernak and
BY Eugene Chester Michaels,
Dawson, Tilton & Graham,
ATTORNEYS.

United States Patent Office 2,961,676
Patented Nov. 29, 1960

2,961,676

ANGULARLY-SUPPORTED SPONGE MOP

Adolph Rebernak, Western Springs, and Eugene Chester Michaels, Chicago, Ill., assignors to American-Marietta Company, Chicago, Ill., a corporation of Illinois

Filed June 20, 1955, Ser. No. 516,514

4 Claims. (Cl. 15—119)

This invention relates to an angularly-supported sponge mop, and more particularly to a sponge mop equipped with means for compressing the mop to squeeze the moisture therefrom while at the same time supporting the sponge body of the mop at an angle to the handle during the mopping operation.

An object of the present invention is to provide a sponge mop in which the sponge body is normally supported in a flat position upon the floor while the handle extends therefrom at a convenient angle for the mopping operation, while at the same time providing means for squeezing the mop body to remove the contained liquid, etc. A further object is to provide in such a mop structure means for maintaining the mop body in a tilted position with respect to the handle while restoring the mop body to a nontilted position in the final squeezing operation. A still further object is to provide a mop in which a relatively wide and thin sponge is employed and supported in such a manner as to rest in a flat position upon the floor while the handle of the mop is inclined at an angle from the mop head for easy manipulation of the sponge in its flat position upon the floor, means being provided for folding the mop body upon itself to squeeze the moisture therefrom and in the latter action to bring the sponge portions into general alignment with the handle. Yet another object is to provide in such a structure rotary hinge means whereby the sponge body and the supporting parts therefor may be tilted with respect to the handle during the mopping and squeezing operations. Still another object is to provide a sponge mop which gives a large floor area while at the same time utilizing a relatively thin sponge and providing means for so compressing the sponge in a single plane that it can be wrung effectively without distortion. A still further object is to provide a sponge having a relatively large floor-contacting area which may be effectively wrung while at the same time maintaining the handle of the mop at an effective working angle in the neighborhood of 45°. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown, in illustrative embodiments, by the accompanying drawings, in which—

Figure 1 is a perspective view of a sponge mop and operating mechanism therefor embodying our invention; Fig. 2, a broken side view in elevation; Fig. 3, a side view in elevation showing the mop body folded upon itself and in the process of being squeezed; Fig. 4, a broken perspective view of the mop structure with the sponge body resting upon the floor in mopping position; Fig. 5, a broken perspective view showing the sponge body in folded and partly compressed condition as the water is being removed; Fig. 6, a broken detail sectional view, the section being taken as indicated at line 6—6 of Fig. 2; Fig. 7, a perspective view of a modified form of mop embodying our invention; Fig. 8, a broken sectional view, the section being taken as indicated at line 8—8 of Fig. 7; and Fig. 9, a broken side view in elevation showing the sponge body folded upon itself and in the process of being compressed for the removal of liquid.

In the illustration given in Figs. 1 to 6, inclusive, **10** designates a mop handle having its lower end pivotally connected to a mop head **11**. In the specific illustration given, the handle is formed of two parts, an upper part **10***a* formed of wood, or the like, and a lower part **10***b* formed of metal, or other suitable material. The two handle parts are preferably threadably connected and an operating tube **12**, equipped with a handle portion **13**, encloses the handle parts, the tube or actuating handle **12** being equipped with connections, which will later be described, for manipulating the mop parts for squeezing the mop body.

The handle portion **10***b* is pivotally connected by the pivot pin **14** to the upwardly-struck ears **15** of the head **11**, as shown best in Fig. 6. As seen in Fig. 6 and also in Figs. 2 and 3, a coil spring **16** extends about the pivot pin **14** and has one leg portion **16***a* engaging the head **11** and a vertical leg portion **16***b* engaging the handle part **10***b*, the spring being stressed so as to maintain the handle part **10***b* normally in the angular position illustrated in Figs. 1 and 2, which is in the neighborhood of a 45° angle. It will be understood that the angle can be varied from the suggested 45° angle to adapt it for convenient operation by the user.

The head **11** has front and rear flanges **17** turned upwardly and the same are provided with slots **18**, as shown best in Fig. 6. As seen from Fig. 2, the rear flange **17** acts as a stop means to determine the angle at which handle portion **10***b* and head **11** are positioned under the urging of coil spring **16**.

Base or hinge plates **19** are connected to the head **11** by means of pivot pins **20** which extend through the inner portions of the plates **19** and through the slots **18**. Each of the plates **19** is preferably provided with side flanges **21** extending upwardly and at their outer ends are apertured to receive threaded studs **23** whereby the plates may be anchored through the means of wing nuts **22** to the sponge body **24**.

The sponge body **24**, which may be formed of cellulose, sponge rubber, fabric, or any suitable material, is preferably provided with a pair of spaced metal plates **25** covered with canvas or other fabric **26**, the plate and canvas being anchored to the top of the sponge by adhesive. Usually plate **25** is provided with threaded stud **23** which extends through the fabric **26** and an opening in the plate **19** and is engaged by wing nut **22** by which the parts are securely anchored together. Since the sponge assembly structure is well known, a detailed description herein is believed unnecessary.

For manipulating the hinge or pressure plates **19** in the compression of the sponge body, toggle links are provided between the handle tube **12** and the plates **19**, the arrangement being such that the plates may rotate angularly with respect to the toggle links as they are manipulated. As shown in the illustration, the handle tube **12** is provided at its bottom with a flared fitting **27**, to which are secured by rivets or other means the diagonally-extending links **28**. The lower ends of the rails **28** are each pivotally connected to a short link member **29**, which has integral diverging legs **30**. The legs **30** straddle a cylindrical disk **31**, which is pivotally mounted by pivot pin **32** upon a pair of spaced ears **33** which are preferably struck upwardly from the metal of each hinge plate **19**. It will be noted that the pivot **32** is in alignment with the central pivot pin **14** which connects the handle **10** to the head plate **11**.

A coil spring **34** is extended about one end of the pivot pin **30***a* which connects the legs **30** of the link **29** with

the disk **31**. As will be seen from Figs. 4 and 5, the spring portion **36** which extends upwardly is confined against outward movement by link member **29**, and the spring portion **35** which extends inwardly thus tends to press the inner portion of each plate **19** downwardly and thereby maintains each plate **19** normally in a flat plane. Movement of the inner ends of the plates **19** in a downward direction is limited by the head **11** and the pivots **20**. It will be observed that the springs **34** carried by the plates **19** tend to maintain the plates in the horizontally-aligned position desired for the mopping operation, while at the same time these springs yield to permit squeezing of the mop when the plates **19** are moved toward each other, as illustrated in Fig. 5, and it will be noted further that the coil spring **16** on the pivoted handle **10** tends to maintain the handle for the mopping operation normally at an angle of about 45° with respect to the mop body **24**.

Operation

In the operation of the structure, the sponge body **24** is normally maintained in the flat position illustrated best in Fig. 1, while the handle **10** extending upwardly and rearwardly therefrom is maintained at a convenient angle for operation generally in the neighborhood of 45°. By means of the springs **16** and **34**, the operating parts are maintained in a firm and relatively rigid condition so that the mop can be manipulated by the user in an effective mopping operation, the flat sponge **24** being moved forwardly and rearwardly across the floor with the full face of the sponge in contact with the floor. When it is desired to wring the mop, the handle tube portion **13** is pressed downwardly, while the handle **10** is held in the other hand of the user and this causes the parts to move to the position shown best in Fig. 5. In this manner, a uniform squeezing of the folded sponge body **24** is brought about. In the latter operation, the sponge body **24** turns from its angular position, as shown in Fig. 1, to a position in which the folded sponge portions **24** are in longitudinal alignment with the mop handle **10**, as illustrated in Fig. 3. The rotary disks **31** mounted upon pivot pins **32** rotate to permit the toggle links **28** and **29** to move to the aligned position shown in Figs. 3 and 5, while in the same operation, each link **29** is free to rotate about the pin **30***a*. Such connections permit the sponge **24** and its supporting plate structure to move from the angular position shown in Figs. 1 and 2, to the non-angular position at which the handle **10** is perpendicular to the sponge body **24** or, expressing it in another way, in which the folded parts of the sponge body, as illustrated in Fig. 5, are longitudinally aligned with the mop handle **10**.

After the sponge has been thoroughly squeezed in the foregoing operation, the parts may be restored to their normal positions, as illustrated in Fig. 1, and in this operation the spring **16** causes the handle automatically to move to the angular position illustrated in Fig. 1 and the springs **34** cause the plate members **19** to move to their longitudinally-aligned position for maintaining the sponge body in its flat, floor-engaging position.

In the modification illustrated in Figs. 7, 8 and 9, the structure is very similar to that shown in Figs. 1 to 6, inclusive, the difference residing mainly in the spring means employed for maintaining the parts in the angular relation shown. In the structure illustrated in Figs. 7 to 9, inclusive, the tubular handle **37** is provided with a transverse pin **38** forming an abutment for the upper end of a compression spring **29**. The lower end of the spring is supported by a cross-pin **40** carried by the lower end of the mop handle **41**. By this means, the handle portion **41** is normally urged downwardly with respect to the operating handle **37**. The lower end of the handle **41** is provided with a slot **42** which receives the pivot pin **43** carried by spaced ears **44** welded to the head plate **45**. A link **46** pivotally connects the boss **47** on the lower handle portion **41** to the boss **48** carried by each of the ears **44**, as illustrated best in Fig. 8.

For maintaining the handle generally at an angle of about 45°, we employ a spring **49** which is connected at its upper end to the handle part **41** and at its lower end to the head plate **45**. Instead of striking segments from the plates **19***a* to form the supporting ears for the toggle links, we weld the ears to the plates. In other respects, the structure is very similar to that already described and shown in Figs. 1 to 6, inclusive

In operation, the spring **39** normally urges the lower handle part **41** downwardly, while the toggle links **28***a* and **29***a*, through their connections with the plates **19***a*, restrain downward movement of the plates. When the handle tube member **37** is pressed downwardly, the spring **39** is compressed while yielding to permit the plates **19***a* to be moved together, in the manner heretofore described in connection with Figs. 1 to 6, for the squeezing of the mop body. At the same time, the spring **49** elongates. After the squeezing operation, the parts are returned to their original position, the spring **39** serving to align the plates **19***a* with the head **45** while the spring **49** draws the handle **41** to an angle of about 45° with respect to the sponge body **50**.

While, in the foregoing specification, we have set forth specific structures in considerable detail for the purpose of illustrating our invention, it will be understood that such specific structures may be varied widely by those skilled in the art without departing from the spirit of our invention.

We claim:

1. In a mop structure, an elongated sponge body, a head resting upon said body, squeeze plates pivotally connected to said head and secured to said body, and a handle pivotally connected to said head, a slide handle mounted on said first-mentioned handle, toggle links connecting said sliding handle to said plates, stop means on one of said handle and head, and spring means cooperating with said stop means to normally yieldably urge said handle to an angle in the neighborhood of 45° with respect to said head but permitting said handle to move to a vertical position with respect to said head when said slide handle is manipulated for squeezing said sponge, the pivotal connection of said squeeze plates to said head comprising pivot pin and slot connections, said pin and slot connections permitting lateral shifting of the inner ends of said squeeze plates away from one another when said sliding handle is moved to press the squeeze plates about the sponge to fold it upon itself, said lateral shifting of the inner ends of the squeeze plates being in addition to any lateral component of movement of said ends caused by rotation of said plates about their respective pin and slot connections, each of said connections serving at least during the latter part of the wringing operation as the fulcrum against which its associated squeeze plate bears to apply wringing pressure to the sponge compressed between said plates.

2. A compression mop, comprising an elongated sponge body, a head resting upon said body and having side flanges provided with spaced slots, a pair of spaced plates secured to said sponge body and having their inner ends connected to said head by pivot pins extending through said slots, said pin and slot connections between said mop head and plates permitting lateral shifting of the inner ends of said plates away from one another when the sponge is folded upon itself during the wringing operation, said lateral shifting of the inner ends of the plates being in addition to any lateral component of movement of said ends caused by rotation of said plates about their respective pin and slot connections, each of said pin and slot connections serving at least during the latter part of the wringing operation as the fulcrum against which its associated plate bears to apply wringing pressure to the sponge compressed between said plates, a handle pivotally mounted upon said mop head, spring means yieldably urging said handle and said mop head into a position of about 45° with respect to each other,

a slide handle mounted upon said first-mentioned handle, toggle links connecting said slide handle and said spaced plates, universal joint connections between said toggle links and said plates, and spring means carried by said toggle links and said plates for normally yieldably urging said plates into horizontally-aligned positions.

3. A mop structure comprising an elongated mop body adapted to rest upon a floor, a mop head positioned above said mop body, a handle pivotally secured to said mop head, cooperating spring means on said handle and mop head and stop means on one of said handle and mop head for yieldably maintaining said handle normally at a predetermined angle with respect to said mop head, squeeze plates mounted upon said mop body on either side of said mop head, lost motion connections between said head and squeeze plates, said lost motion connections permitting lateral shifting of the inner ends of said squeeze plates away from one another when the mop body is folded upon itself during the wringing operation, said lateral shifting of the inner ends of the squeeze plates being in addition to any lateral component of movement of said ends caused by rotation of said plates about their respective lost motion connections, each of said lost motion connections serving at least during the latter part of the wringing operation as the fulcrum against which its associated squeeze plate bears to apply wringing pressure to the mop body compressed between said plates, a sliding handle mounted upon said first mentioned handle, toggle links carried by said sliding handle and connected by universal joints to said plates, said lost motion connections maintaining continuous wringing pressure upon said squeeze plates when said sliding handle is moved to compress said squeeze plates about said mop body to fold it upon itself, and spring means carried by said toggle links and squeeze plates pressing upon said plates and normally yieldably maintaining them in horizontal alignment with said mop head.

4. In a mop structure, an elongated mop body adapted to rest upon a floor, a mop head positioned at the longitudinal center of said body, a pair of mop plates secured to said mop body and pivotally attached to said mop head by means of lost motion connections, said lost motion connections permitting lateral shifting of the inner ends of said mop plates away from one another when the mop body is folded upon itself during the wringing operation, said lateral shifting of the inner ends of the mop plates being in addition to any lateral component of movement of said ends caused by rotation of said plates about their respective lost motion connections, each of said lost motion connections serving at least during the latter part of the wringing operation as the fulcrum against which its associated mop plate bears to apply wringing pressure to the mop body compressed between said plates, a mop handle pivotally secured to said mop head, cooperating spring means on said handle and mop had and stop means on one of said handle and mop head for yieldably urging said handle normally to a predetermined inclination away from the perpndicular with respect to said mop head and body, an actuating handle associated with said mop handle, and links connecting said actuating handle and said mop plates for compressing said mop body upon itself against the force of said spring means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,222,971	Moe	Apr. 17, 1917
1,437,789	Whyte	Dec. 5, 1922
1,771,325	Cotter	July 22, 1930
2,093,052	Muckenhirn	Sept. 14, 1937
2,460,763	Oakhill	Feb. 1, 1949
2,730,743	Zottola	Jan. 17, 1956
2,834,974	Greenleaf	May 20, 1958
2,864,107	Greenleaf	Dec. 16, 1958

FOREIGN PATENTS

2,504	Great Britain	of 1912
53,091	Denmark	May 3, 1937
76,184	Norway	Jan. 30, 1950
197,619	Great Britain	May 17, 1923
216,565	Germany	Nov. 24, 1909
466,474	Canada	July 11, 1950
496,850	Belgium	July 31, 1950
617,197	Germany	Aug. 14, 1935