April 9, 1968 B. O. PUGH 3,376,654

DRY CLEANER MACHINE DRIVE ASSEMBLY

Filed March 21, 1966 4 Sheets-Sheet 1

Fig. 1

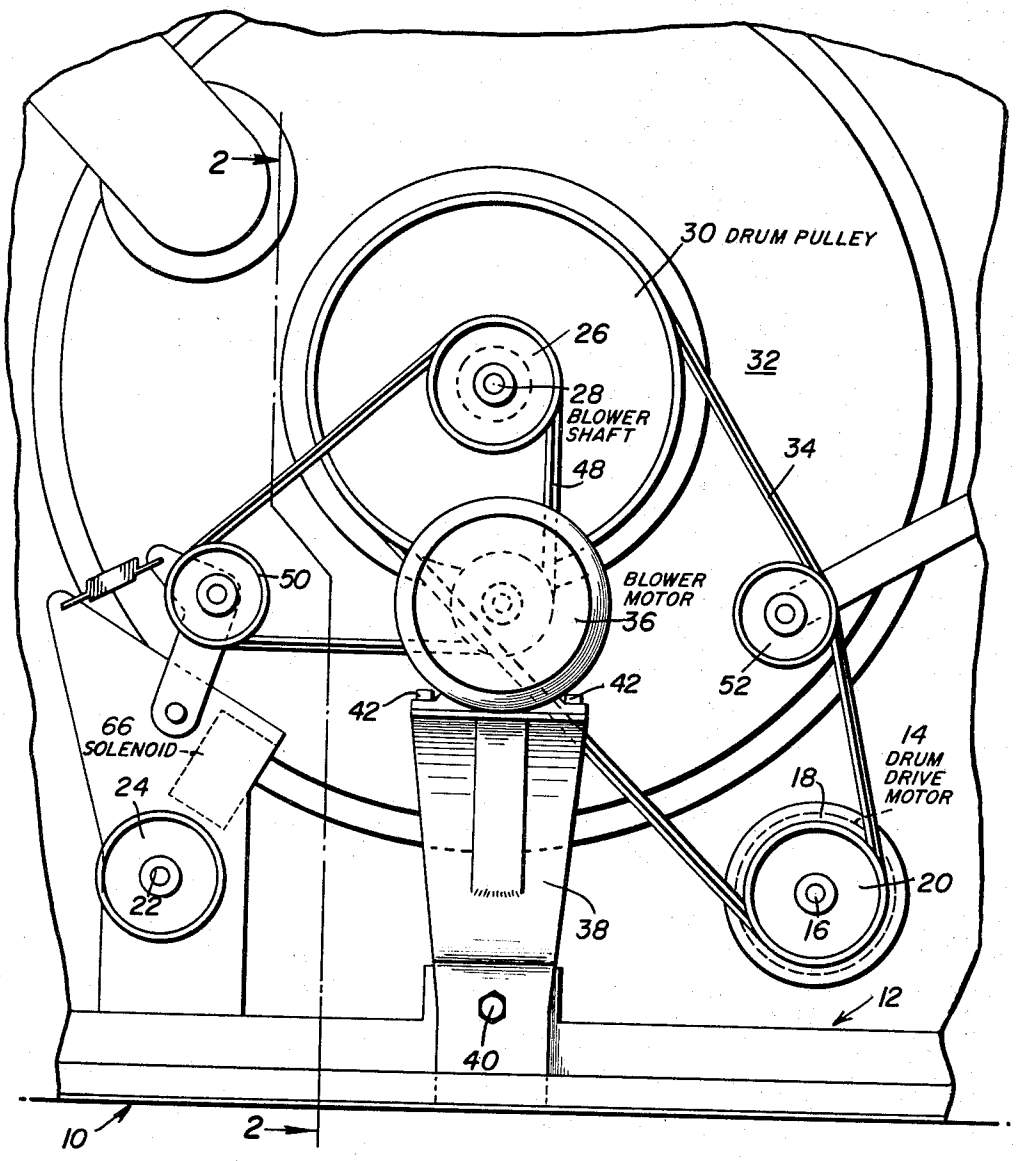
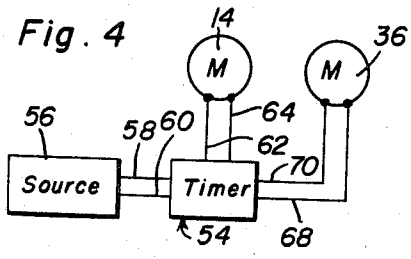


Fig. 4



Bobby O. Pugh

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

April 9, 1968 B. O. PUGH 3,376,654

DRY CLEANER MACHINE DRIVE ASSEMBLY

Filed March 21, 1966 4 Sheets-Sheet 2

Fig. 2

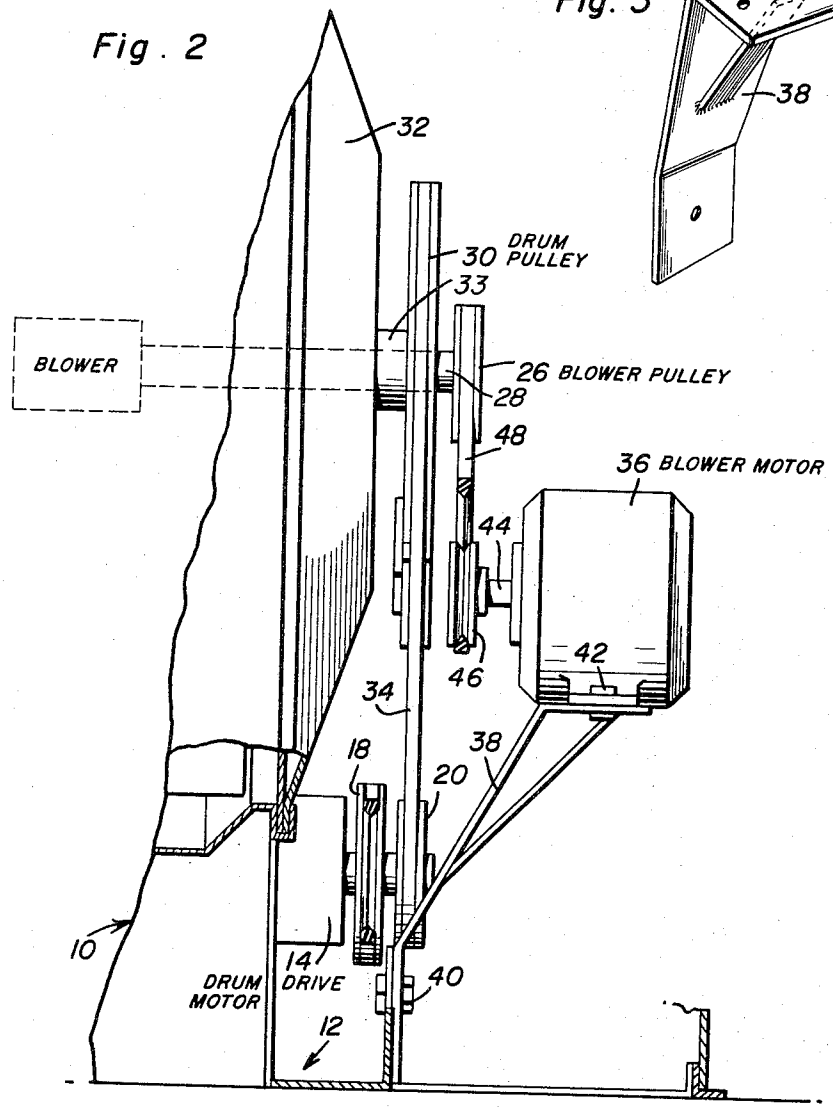


Fig. 3

Bobby O. Pugh

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

April 9, 1968 B. O. PUGH 3,376,654

DRY CLEANER MACHINE DRIVE ASSEMBLY

Filed March 21, 1966 4 Sheets-Sheet 3

Fig. 5

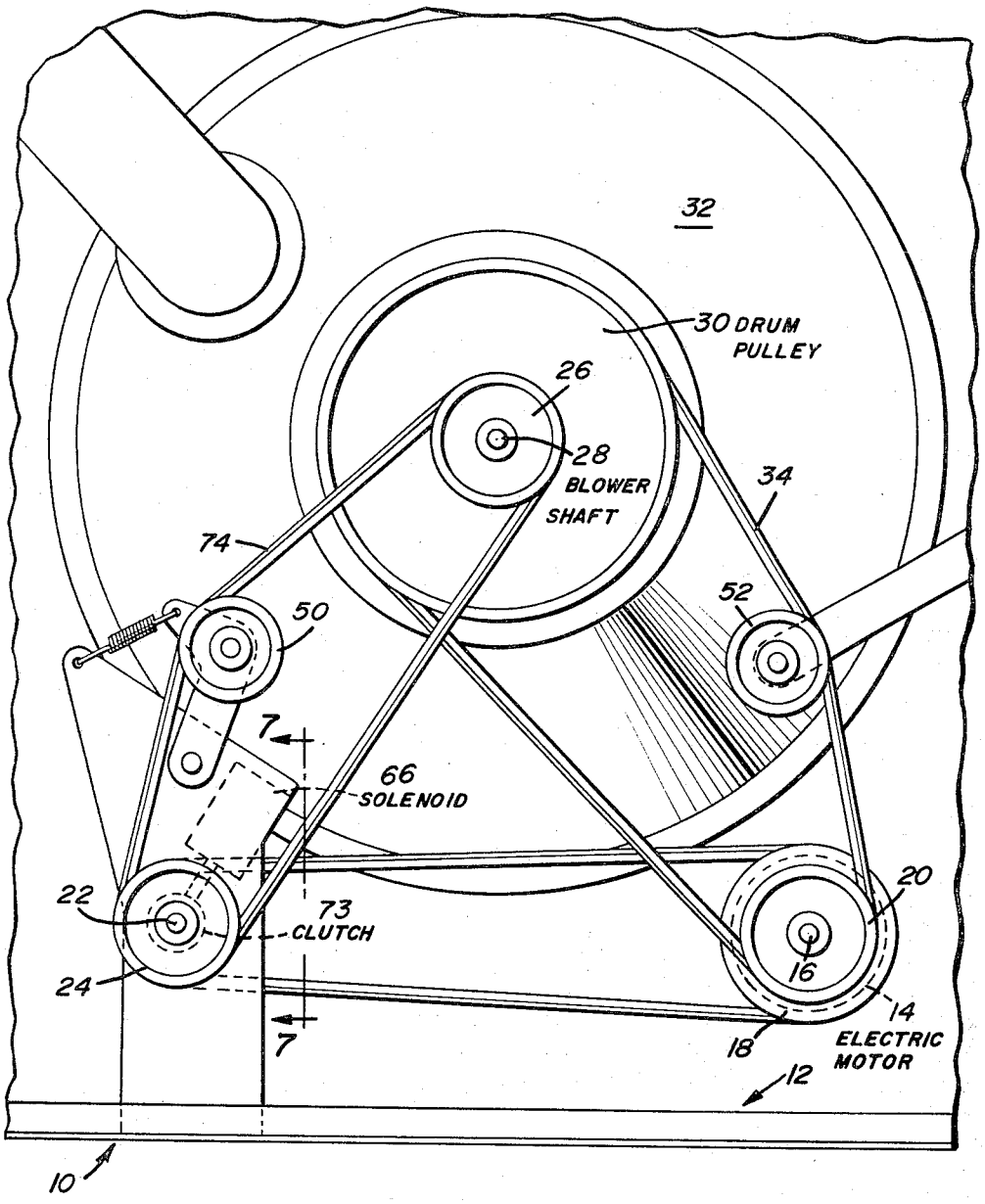
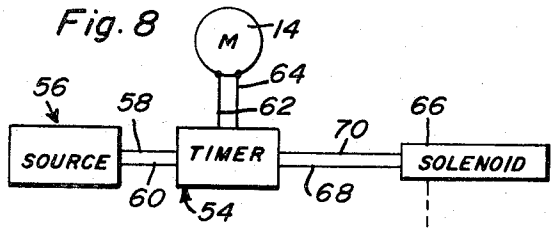


Fig. 8



Bobby O. Pugh

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

April 9, 1968 B. O. PUGH 3,376,654

DRY CLEANER MACHINE DRIVE ASSEMBLY

Filed March 21, 1966 4 Sheets-Sheet 4

Fig. 6

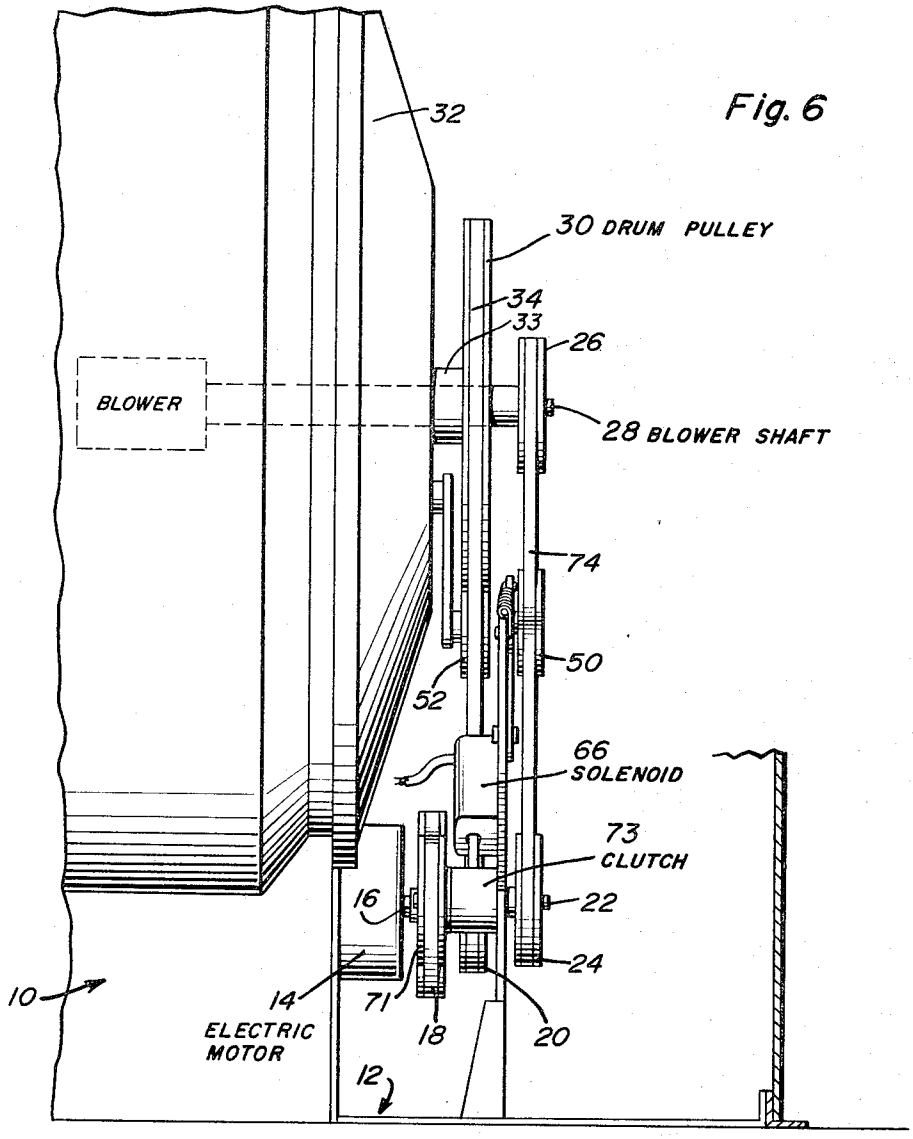
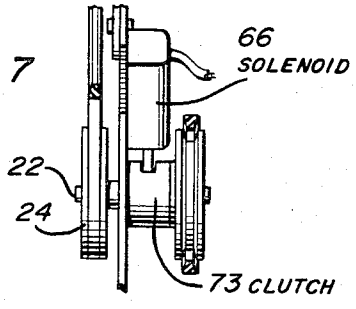


Fig. 7



Bobby O. Pugh
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

United States Patent Office

3,376,654

Patented Apr. 9, 1968

3,376,654

DRY CLEANER MACHINE DRIVE ASSEMBLY

Bobby O. Pugh, 5706 La Sierra Ave.,
Riverside, Calif. 92505

Filed Mar. 21, 1966, Ser. No. 535,971
3 Claims. (Cl. 34—53)

ABSTRACT OF THE DISCLOSURE

A conversion method for extending the average operating time between repair intervals of a dry cleaner machine which includes a main driving motor operating the rotating cleaner drum during a dry cleaning cycle by means of a pulley drive. During a period of time within the dry cleaning cycle, a timer actuates a solenoid which in turn actuates a clutch for the purpose of engaging two pulleys. The first of these pulleys is linked by means of a belt to the main drive motor and at such time when the clutch is actuated and the first and second pulleys are linked, rotation is imparted to the second pulley. Attached to this second pulley is a belt which is extended over a blower shaft. Therefore, in effect, the main drive motor continually operates the rotating drum and in addition operates the blower during a preselected period within the operation cycle. The conversion method practiced upon the above characterized machine consists of removing the pulley between the main drive motor and the aforementioned first pulley which is clutch linked to the second pulley. In addition, the electrical output from the timer is disconnected from the solenoid thereby completely disconnecting the solenoid, clutch, and associated pulleys from the system. Instead, the timer output lines are connected to a second motor which is mounted on the machine, the shaft of this motor is coupled to a pulley which drives the blower.

This invention relates to a novel and useful dry cleaning machine drive assembly and more specifically to a modification of an existing dry cleaner machine drive assembly.

At least one make of dry cleaner machine presently in use includes a frame from which a drum is rotatably journaled and a blower rotatably journaled from the drum with single motor means being drivingly connected to the drum and also the blower. In these conventional dry cleaning machines the single motor means drives the drum and also a lay shaft on which a pulley is journaled, the latter being drivingly connected to the blower and a solenoid actuated clutch being provided for selectively drivingly coupling the lay shaft to the pulley thereon. A suitable timing mechanism is provided and electrically connects the solenoid actuated clutch to a suitable source of electrical potential during operation of the single motor means at pre-programmed intervals for causing the blower to operate during such intervals.

Although at first experience this type of intermittent driving of the blower appears to be economical in that only one motor is utilized to drive both the drum and the blower, the solenoid actuated clutch must not only be capable of transmitting the normal blower starting loads such as would be the case if the single motor drove only the blower, but also an additional load represented by the momentum of the heavy drum, the latter resisting the motor slowing down. If the solenoid actuated clutch were required only to handle the driving torque of the motor and the inertia of the rotating parts of the motor independently of the inertia of the heavy drum, the starting load on the clutch to initiate rotation of the blower would be substantially reduced and the clutch would have a greatly increased life expectancy.

It is accordingly the main object of this invention to provide more efficient drive means for the blower of this type of conventional dry cleaning machine and to provide a means whereby such a conventional dry cleaning machine may be readily modified in accordance with the present invention.

A further object of this invention is to provide supplemental drive means for the blower of the aforementioned type of conventional dry cleaning machine which will be relatively inexpensive to purchase and easy to install.

A final object of this invention to be specifically enumerated herein is to provide a novel blower drive conversion assembly for substantially all dry cleaning machines being produced with only single motor means for driving both the drum and blower of the dry cleaning machine.

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 drawing forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary rear elevational view of a conventional dry cleaning machine drive assembly modified in accordance with the present invention;

FIGURE 2 is a fragmentary sectional view of the drive assembly illustrated in FIGURE 1 taken substantially upon a plane indicated by the section line 2—2 of FIGURE 1;

FIGURE 3 is a perspective view of the mounting bracket of the additional drive motor of the instant invention illustrated on somewhat of a reduced scale;

FIGURE 4 is a diagrammatical view of a portion of the electrical controls of the modified dry cleaning machine with portions of the old single motor drive circuitry illustrated in phantom lines;

FIGURE 5 is a fragmentary rear elevational view of a conventional dry cleaning machine drive assembly;

FIGURE 6 is a fragmentary side elevational view of the drive assembly illustrated in FIGURE 5;

FIGURE 7 is a fragmentary sectional view taken substantially upon a plane indicated by the section line 7—7 of FIGURE 5; and

FIGURE 8 is a diagrammatic view of a portion of the electrical controls of the conventional dry cleaning machine.

Referring now more specifically to the drawings, the numeral **10** generally designates a conventional form of dry cleaning machine modified in accordance with the present invention. The machine **10** includes a frame generally referred to by the reference numeral **12** from which a main drive motor **14** is supported. The drive motor **14** includes an output shaft **16** having a first large pulley **18** mounted thereon as well as a second pulley **20**. The first large pulley **18** is aligned with a third pulley **71** on a lay shaft **22** also journaled from the frame **12** and having a second pulley **24** rotatably mounted thereon. A solenoid **66** actuates clutch assembly **73** which is provided for drivingly coupling the lay shaft **22** to the second pulley **24** and the second pulley **24** is aligned with the drive pulley **26** of a blower shaft **28** of the machine **10**. Blower shaft **28** operates a blower (shown in phantom) which is located in the interior of the machine. The second pulley **20** is aligned with a drive pulley **30** carried by a hollow rotatable shaft **33** which is affixed to the drum **32** of the machine **10**. An endless flexible belt **34** drivingly couples the pulley **20** to the pulley **30** for rotation of the drum **32** in response to operation of the electric motor **14**.

Originally, an endless flexible belt **74** drivingly connects the second pulley **24** to the pulley **26** wherein the output shaft **16** of the motor **14** would be drivingly coupled to

the blower shaft **28** during actuation of the clutch assembly.

Inasmuch as the starting load of the blower shaft **28** is substantial and the aforementioned solenoid actuated clutch assembly was found not to be capable of repeatedly handling this starting load with a long life expectancy due to the increased inertia of the drive shaft of the motor **16** by the heavy drum **32** driven by the drive shaft **16**, the machine **10** has been modified by providing a second motor **36** mounted from the frame **12** of the machine **10** by means of an inverted generally L-shaped bracket **38** secured to the frame **12** as at **40** and having the motor **36** secured thereto in any convenient manner such as by fasteners **42**. The motor **36** includes an output shaft **44** on which a drive pulley **46** is mounted and the drive pulley **46** is aligned with the pulley **26** on the blower shaft **28** and is drivingly coupled to the latter by means of an endless flexible belt **48** entrained about the pulley **46** and the pulley **26** as well as a tensioning pulley **50** previously utilized to tension the discarded endless flexible belt used to drivingly connect the pulley **24** to the pulley **26**, a tensioning pulley **52** being utilized to properly tension the endless flexible belt **34**.

The machine **10** includes an electrical timer generally referred to by the reference numeral **54**, see FIGURE 4, electrically connected to a suitable source of electrical potential **56** by means of suitable conductors **58** and **60**. The timer **54** is electrically connected to the motor **14** by means of suitable conductors **62** and **64**. The timer was also previously electrically connected to the solenoid **66** of the solenoid actuated clutch assembly above referred to by means of conductors **68** and **70**. However, in order to operate the motor **36**, which requires generally the same amount of current as the solenoid **66**, no longer used, the conductors **68** and **70** are disconnected from the solenoid **66** and connected to the motor **36** for actuation of the latter in lieu of solenoid **66**. Of course, actuation of the motor **36** causes the blower shaft **28** to be rotated at the same time intervals determined by the timer **54** that the solenoid **66** was previously actuated to drivingly connect the pulley **18** to the pulley **26** through the lay shaft **22**.

Accordingly, it may be seen that by the addition of the electric motor **36** to the machine **10** and by causing the electric motor **36** to be actuated from the same conductors **68** and **70** which were previously utilized to actuate the solenoid **66**, operation of the blower shaft **28** is effected at the proper pre-programmed periods determined by the timer **54**.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A dry cleaner machine drive assembly including a rotatable drum coupled to a hollow rotatable first shaft upon which is fixedly mounted a first pulley wheel, a second rotatable shaft independently disposed and coaxial within the hollow of said first shaft and upon which is

mounted a second pulley wheel at one end thereof, the opposite end of said second shaft coupled to blower means enclosed within said machine, said blower means forcing air circulation within said drum, a third pulley wheel mounted upon the rotatable shaft of a first drive motor, said motor fixed to said machine, said third pulley wheel being in planar alignment with said first pulley wheel, an endless flexible belt entrained about said first and third pulley wheels, motion of which causes rotation of said drum, a second motor supported from said machine in fixed position thereto and including a drive shaft having a fourth pulley wheel mounted thereon in coplanar alignment with said second pulley wheel, a flexible endless belt entrained about said second and said fourth pulley wheels, motion of which causes rotation of said blower means, a two state actuation electric timer selectively interconnecting a voltage source to said motors wherein said first state actuation allows said first motor to run continually during an operation cycle and second state actuation allows said second motor to run during selected intervals within said operation cycle.

2. The combination of claim **1** wherein said machine includes belt tensioning means operatively mounted in engagement with said first and second endless belts for maintaining said belts in a properly tensioned condition.

3. The method of extending the average operating time between repair intervals of a dry cleaner machine including a rotatable drum driven from a main motor output shaft, a blower drive shaft driven at certain periods during rotation of the drum by means of a driven pulley drivingly connected to the blower drive shaft by means of an endless drive member driven from a rotatable shaft on which the driven pulley is journaled and in turn driven by said main motor, a solenoid clutch operative to drivingly connect said rotatable shaft to said driven pulley for rotation of the latter with the former, and a timer mechanism electrically connected to a suitable source of electrical potential including conductor means operative to electrically connect said source to said solenoid clutch for actuation of said clutch at said certain periods, said method comprising the steps of disconnecting said conductor means from said solenoid clutch, providing a second motor, removing the second mentioned drive member from driving engagement with said blower drive shaft, establishing a drive connection between said second motor and said blower drive shaft, and electrically connecting said conductor means to said second motor for effecting operation of the latter in response to actuation of said timer mechanism in lieu of actuation of said solenoid clutch.

References Cited

UNITED STATES PATENTS

2,755,716	7/1956	Epstein	34—53 X
3,002,287	10/1961	Smith	68—20 X
3,103,420	9/1963	Epstein	34—58
3,161,481	12/1964	Edwards	34—45

CHARLES J. MYHRE, *Primary Examiner.*

FREDERICK L. MATTESON, JR., JAMES W. WESTHAVER, *Examiners.*

A. D. HERRMANN, *Assistant Examiner.*