Feb. 5, 1963 D. L. HICKS 3,076,651

BOWLING PIN CLEANER

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Fig. 1

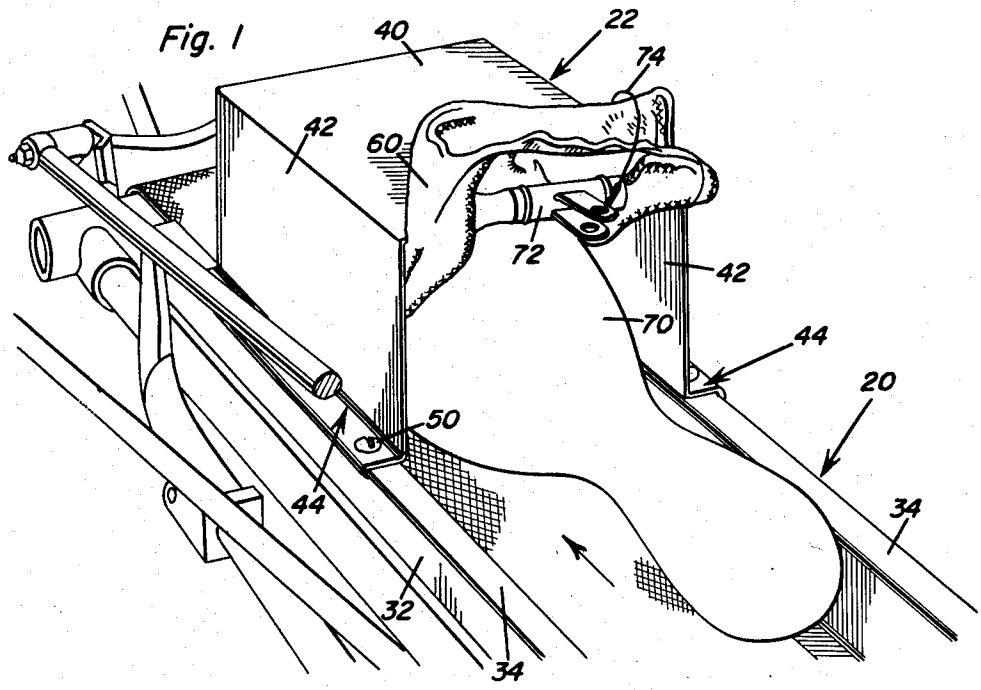
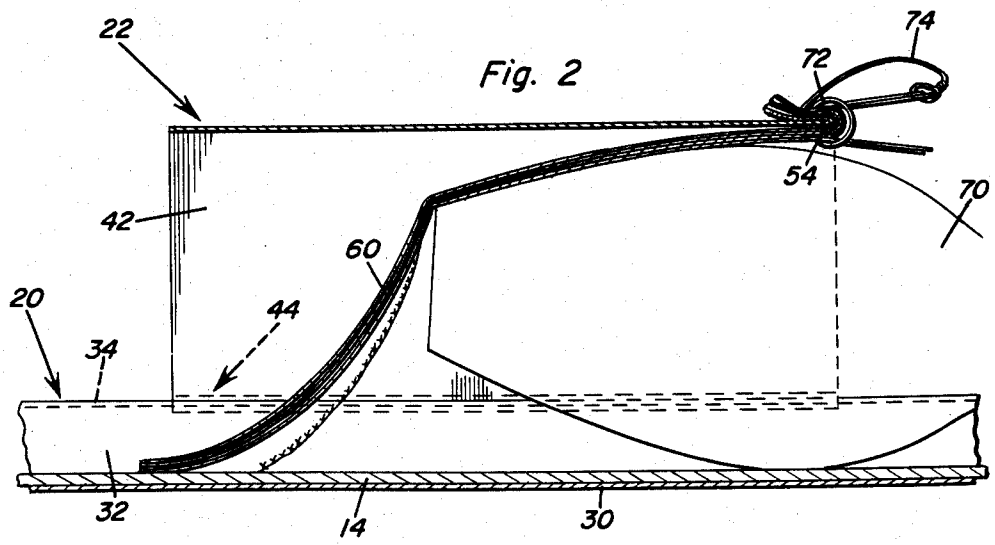


Fig. 2



Duane L. Hicks
INVENTOR.

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

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Fig. 3

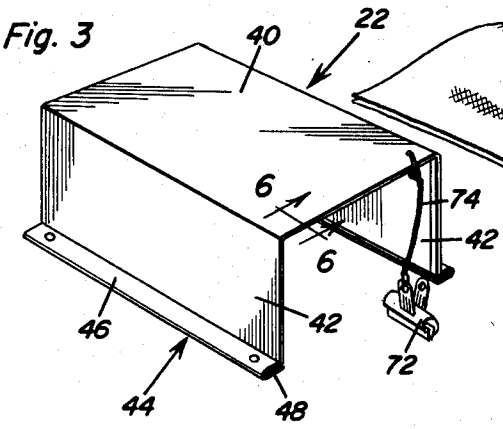


Fig. 4

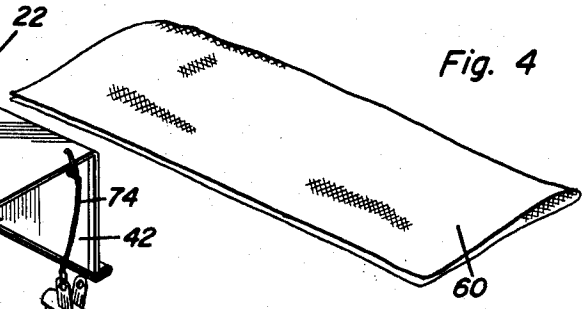


Fig. 7

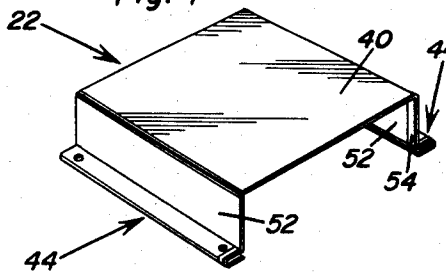


Fig. 5

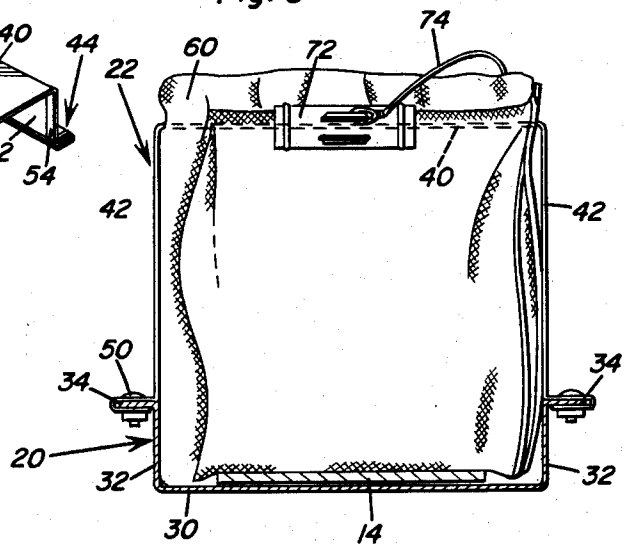


Fig. 6

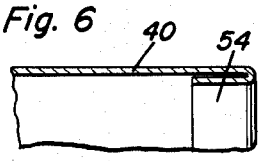
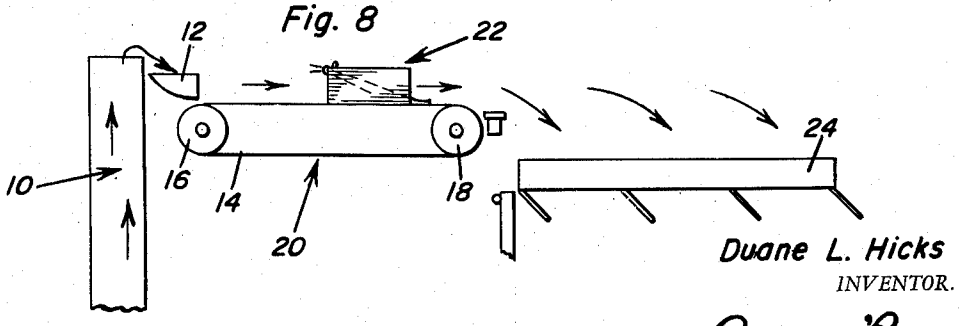


Fig. 8



Duane L. Hicks

INVENTOR.

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

Attorneys

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BOWLING PIN CLEANER

Duane L. Hicks, Birch Run, Mich., assignor of ten percent to Norwood Brown, Clio, Mich., and ten percent to Ira D. Bare, Clio, Mich.

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12 Claims. (Cl. 273—54)

This invention comprises a novel and useful bowling pin cleaner, and more particularly relates to a cleaning device adapted to be disposed in operative relation to the bowling pin conveyor of an automatic bowling pin setting machine to effect a cleaning operation upon the bowling pins as the latter are automatically transported from the bowling alley pit to the automatic pin setter frame by which they are returned to the alley for use.

A further important object of the invention is to provide a device in the form of an attachment which can be readily and easily applied to and conveniently adjusted upon the conventional bowling pin conveyor whereby to automatically effect the cleaning of bowling pins as they are conveyed by a bowling pin elevator from the alley pin to the pin setting frame of the automatic pin setter.

A further object of the invention is to provide a device in accordance with the foregoing objects wherein a cleaning means to effect a cleaning operation upon the bowling pins is detachably mounted upon the device in a readily accessible manner to automatically effect its cleaning operation upon the bowling pins as the latter are conveyed through the device by the bowling pin conveyors.

Still another object of the invention is to provide a device in accordance with the foregoing objects wherein the cleaning device consists of one or more plies of a pliable fabric, such as a towel or the like, and which hangs downwardly from the device into the path of travel of the bowling pins carried by the conveyor in order to frictionally engage, rub against, and thus effect a cleaning operation upon the surface of the pins conveyed there past by the conveyor.

Yet another object of the invention is to provide a device in accordance with the preceding objects in which the pressure with which the cleaning elements engage the bowling pins can be readily varied by repeatedly folding and refolding the cleaning member in order to vary the pressure with which the same engages the surface of a bowling pin being conveyed there past.

A still further object of the invention is to provide a device in the form of an attachment which will be extremely simple in construction and yet may be readily and easily adjustably applied to the conventional supporting frame of a bowling pin conveyor in positions readily adjustable therealong as desired.

A more specific object of the invention is to provide a device in compliance with the above set forth objects which shall consist of a single unitary thin metallic sheet appropriately shaped into a U-shaped configuration to provide a housing open at both ends, with the sides of the U-shaped body supporting the latter and adjustably secured to the sides of the support frame of the bowling pin conveyor and with the cleaning element of the device being disposed within this open housing and overlying the bowling pin conveyor passing therethrough.

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 perspective view showing a portion of a bowling pin conveyor forming a part of a conventional automatic bowling pin setting machine and illustrating

the manner in which the bowling pin cleaner of the present invention is applied thereto and showing the manner in which a bowling pin in passing through the device is subjected to a cleaning operation in accordance with this invention;

FIGURE 2 is a vertical longitudinal sectional view through the apparatus of FIGURE 1 and showing in particular the manner in which the cleaning element is associated with the device and performs its cleaning operation upon a bowling pin passing therethrough;

FIGURE 3 is a perspective view of the housing forming an essential component of this device;

FIGURE 4 is a perspective view of a cleaning element such as a towel which is to be attached to the housing to effect the cleaning operation;

FIGURE 5 is a view in vertical transverse section through the apparatus of FIGURE 1 and illustrating the manner in which the cleaning element is associated with the housing of the attachment and cooperates with the bowling pin conveyor;

FIGURE 6 is a detail view in vertical longitudinal section showing in detail a lip formed to reinforce the front edge of the device;

FIGURE 7 is a perspective view of a second form of the device adapted for use with the bowling pin conveyor of an automatic bowling pin setting machine in which less clearance is desired between the housing of the device and the support frame of the conveyor as, for example, when smaller bowling pins are to be handled by the device or where there is a greater clearance between the top flanges of the bowling pin conveyor support frame and the bowling pin conveyor therein; and

FIGURE 8 is a somewhat diagrammatic view showing the manner in which the cleaning device of this invention is mounted upon a bowling pin conveyor and showing the relationship of the bowling pin conveyor to the bowling pin elevator and the bowling pin setting frame of the pin setter.

Although the bowling pin cleaner of this invention can obviously be utilized in different types of bowling pin setting machines, one convenient arrangement of a well known form of bowling pin setting machine is illustrated in FIGURE 8. In this form, there is diagrammatically indicated a bowling pin elevator indicated by the numeral 10 by which bowling pins are lifted from the pit at the target end of the bowling alley, are dropped upon a chute 12 and upon a horizontally extending endless conveyor 14 in the form of a belt entrained over supporting and driving rollers as at 16 and 18. The bowling pin conveyor is designated generally by the numeral 20 and includes a support frame structure which will be more specifically referred to hereinafter. The cleaning device of this invention, designated generally by the numeral 22, is mounted upon the support frame of the conveyor 20 in a manner to be subsequently set forth and cleans the bowling pins as they are conveyed by the conveyor in the direction indicated by the arrows therein from the discharge chute 12 of the bowling pin elevator 10 and onto the bowling pin setting frame 24 forming a part of the automatic pin setter, the other details of which are not shown and form no part of the invention herein disclosed and claimed.

Referring now more specifically to FIGURES 1, 2 and 5, it will be observed that the bowling pin conveyor, designated generally by the numeral 20, includes a generally U-shaped trough forming a part of its support frame. This trough consists of a bottom wall 30 with a pair of upstanding side walls 32, which latter have outturned horizontal flanges 34. The endless conveyor belt 14 previously referred to has its upper flight passing through the trough and resting upon the top surface of the bottom wall 30 as shown in FIGURES 2 and 5.

Consequently, bowling pins discharged from the chute 12 of FIGURE 8 into the trough are carried by the belt 14 along the length of the trough and in turn are discharged into the frame 24.

The present invention makes use of an attachment to be adjustably mounted upon and supported by the trough of the bowling pin conveyor 20 to automatically effect a cleaning operation upon the bowling pins as they traverse the length of this trough. Consequently, each time the bowling pins are used, and are returned to the bowling pin setting machine, they are subjected to a cleaning operation so that the pins are maintained in a clean condition ready for re-use. Since heretofore cleaning operations upon the pins were necessarily performed by hand, the present invention, at no requirement of labor of the bowling alley attendants, serves to retain the bowling pins in an attractive clean condition at all times.

Referring now primarily to FIGURES 1–4, it will be seen that the bowling pin cleaner 22 consists of an inexpensive light-weight U-shaped hollow body mounted in a relatively inverted position with respect to the support frame of the bowling pin conveyor. Thus, a single sheet of thin metal is bent to provide a web portion 40 having integral depending support legs or side walls 42 which, at their lower ends, are provided with fastening means indicated generally by the numeral 44 by which the device is mounted upon the flanges 34 of the conveyor. These fastening means consist of laterally outturned flanges 46 which at their outer ends are inturned or bent inwardly beneath themselves as at 48, to thus provide a channel which embraces and receives therein, as shown clearly in FIGURE 5, the outturned flanges 34 of the bowling pin conveyor support frame. The fastening means 44 is slidably engaged upon the flanges 34 of the bowling pin trough so that the device may be readily slid longitudinally as required in order to position it to the best advantage.

At this point it may be understood that one or more of these devices may be mounted at selected positions along the length of the conveyor as desired.

In order to secure the device fixedly at an adjusted position, there are preferably provided screws or other equivalent fasteners 50 which extend through apertures drilled in the flanges 46, 48 and 34.

As so far described, it will be understood that the cleaner 22 provides an open tunnel-like member which is freely open at both its ends and which overlies the trough of the conveyor frame and the conveyor 14 therein. As shown in FIGURE 3, the support legs 42 for this purpose are relatively long so that they will position the web 40 a sufficient distance above the conveyor belt 14 to accommodate the larger sizes of pins such as tenpins which may pass therethrough. In other instances, however, as shown in FIGURE 7, a similarly constructed embodiment of the cleaner 22 may consist of the web 40 with relatively short support legs or side walls as at 52 and having the same fastening means 44 as previously described. With this construction, the web 40 is disposed at a much lower distance with respect to the flanges 34 of the support frame of the bowling pin conveyor so that the device is particularly adapted to cleaning smaller bowling pins such as duckpins; or to be utilized with a bowling pin conveyor construction in which the conveying belt 14 passing therethrough is disposed at a greater vertical distance below the support or mounting flanges 34.

In order to strengthen and stiffen and rigidify the thin metal construction of the cleaner 22, it is preferred to form the forward edges of the sheet metal, web 40, and side walls 42 with an inturned flange or lip as at 54 in FIGURE 6.

A removable cleaning element is attached to the housing of the cleaner 22. This cleaning element, as shown in FIGURES 4 and 5 in conjunction with FIGURES 1 and 2, preferably consists of a sheet of a suitable fabric, such as a towel or the like, as indicated at 60. The material 60 may be suitably folded upon itself a number of times in order that its shape and size will be sufficient to be received within the confines of the U-shaped housing of the cleaner 22 and yet will be of sufficient length to extend therethrough and rest upon the conveyor belt 14 and the bowling pin 70 as the latter passes through the housing.

A spring clip, such as indicated at 72, is provided for gripping what may be termed the inlet of the housing to thereby clip the adjacent portion of the cleaning member 60 to the edge of the web 40 of the housing, as clearly shown in FIGURES 1 and 2. The clip itself may be permanently retained or anchored, as by a string or cable 74 to a portion of the web or other part of the housing of the cleaner 22 in order to insure its ready availability during the process of changing or replacing the cleaning element 60.

When it is desired to effect a more thorough cleaning of a bowling pin as the latter passes through the housing of the cleaner 22 by the operation of the conveyor belt 14, it is merely necessary to double or increase the folds or thicknesses of the material which lies between the top of the housing web 40 and the adjacent surface of the bowling pin 70 passing therethrough. It will thus be observed that the frictional engagement of the cleaning member 60 with the bowling pin can be adjusted or varied in order to variably effect the cleansing operation of the same upon the bowling pin. In some instances, the cleaning element may consist merely of an untreated fabric, such as a towel or the like. In other instances, the cleaning element may be impregnated with suitable cleaning materials to effect a better cleansing of the bowling pin.

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 bowling pin cleaner for use with a bowling pin conveyor of the type having an elongated, horizontally disposed power operated conveyor including stationary vertical side walls with a moving bottom wall forming a trough along which bowling pins are conveyed, said cleaner comprising a horizontally elongated tunnel-like support structure adapted to overlie a bowling pin conveyor, means for supporting and mounting said support structure upon the side walls of the bowling pin conveyor, cleaning means comprising at least one sheet of pliable material carried by said support structure, means securing said sheet to said support structure, at the forward end thereof relative to the travel of bowling pins on the conveyor, said sheet being free at its side edges and rear end and lying within said tunnel-like support structure and being of sufficient length to simultaneously slidably engage the major portion of the length and the entire top surface of a bowling pin as the latter is transported by said conveyor past said support structure.

2. The combination of claim 1 wherein said support structure includes parallel support legs having fastening means for securing them upon the side walls of said bowling pin conveyor.

3. The combination of claim 1 wherein said support structure includes support legs having fastening means for securing them upon the side walls of said bowling pin conveyor, said support structure including a relatively inverted U-shaped hollow body adapted to straddle said conveyor and having a web adapted to overlie said bowling pin conveyor, and said support legs comprising the side members of said U-shaped body.

4. The combination of claim 1 wherein said support structure includes support legs having fastening means for

securing them upon the side walls of said bowling pin conveyor, said support structure including a relatively inverted U-shaped body adapted to straddle said conveyor and having a web adapted to overlie said bowling pin conveyor, and said support legs comprising the side members of said U-shaped body, said cleaning means including a plurality of sheets of a pliable fabric disposed within said U-shaped body and extending from said web to engage against said conveyor for rubbing against a bowling pin carried by said conveyor.

5. The combination of claim 4 wherein said fastening means secures said cleaning means to said web at the inlet end of said body.

6. The combination of claim 1 wherein said support structure includes support legs having fastening means for securing them upon the side walls of said bowling pin conveyor, said support structure including a relatively inverted U-shaped body adapted to straddle said conveyor and having a web adapted to overlie said bowling pin conveyor, and said support legs comprising the side members of said U-shaped body, said support leg fastening means comprising flanges extending laterally from the ends of said support legs remote from said web, said last-mentioned flanges being adapted for slidable embracing engagement with corresponding flanges on the support frame of a bowling pin conveyor.

7. An apparatus for automatically cleaning bowling pins comprising in combination, a bowling pin conveyor for an automatic bowling pin setting machine and a pin cleaner associated with said conveyor for cleaning bowling pins carried by the latter, said conveyor comprising an elongated horizontal trough including spaced, stationary vertical side walls and a movable, power-operated, pin carrying bottom wall therebetween, said pin cleaner comprising a stationary support structure overlying said conveyor, mounting means maintaining said support structure in fixed relation to said bottom wall, cleaning means comprising at least one sheet of pliable material carried by said support structure at the forward end thereof relative to the travel of bowling pins on said conveyor, said sheet being free at its side edges and rear end and lying between said conveyor side walls and being of sufficient length to wipe and engage the top surface of a bowling pin

carried by said conveyor simultaneously along the major length of a bowling pin.

8. The combination of claim 7 wherein said support structure includes support legs having fastening means for securing them upon the side walls of said bowling pin conveyor.

9. The combination of claim 7 wherein said support structure includes support legs having fastening means for securing them upon the side walls of said bowling pin conveyor, said cleaning means including a plurality of sheets of a pliable fabric disposed within said support structure for rubbing against a bowling pin carried by said conveyor.

10. The combination of claim 7 wherein said support structure includes support legs having fastening means for securing them upon the side walls of said bowling pin conveyor, said cleaning means including a plurality of sheets of a pliable fabric disposed within said support structure and extending from said body into engagement with said conveyor for rubbing against a bowling pin carried by said conveyor.

11. The combination of claim 10 including fastening means for securing said cleaning means to said support structure.

12. The combination of claim 7 wherein said support structure includes support legs having fastening means for securing them upon the side walls of said bowling pin conveyor, said cleaning means including a plurality of sheets of a pliable fabric disposed within said support structure for rubbing against a bowling pin carried by said conveyor, said support leg fastening means comprising flanges extending laterally from the ends of said support legs remote from said web, said last-mentioned flanges being adapted for slidable embracing engagement with corresponding flanges and the support frame of a bowling pin conveyor.

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