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K. F. OLDENBURG ET AL
HOUSING FOR BUSINESS MACHINE

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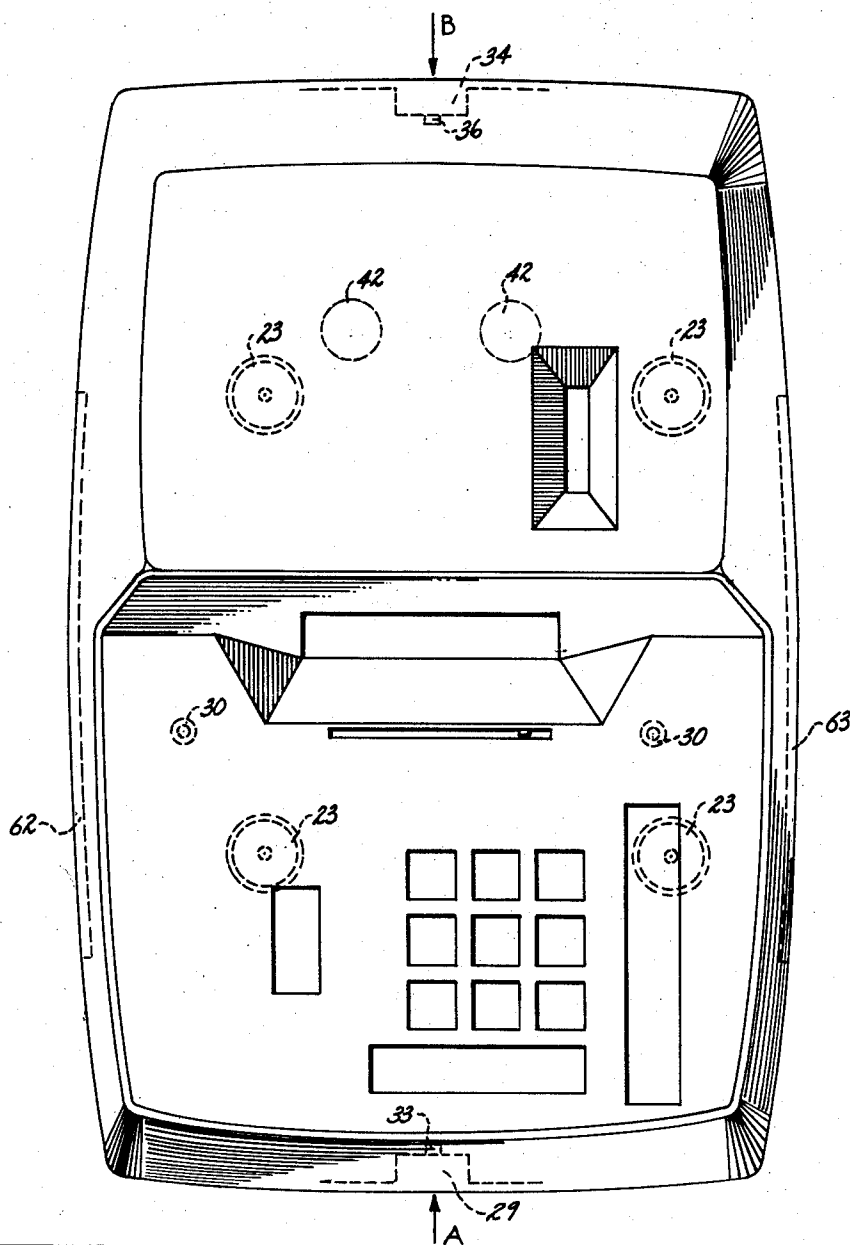


FIG. 1

INVENTOR.
KENNETH F. OLDENBURG
DOMINICK FAZIO

BY

Ind. F. Schmitt
ATTORNEY

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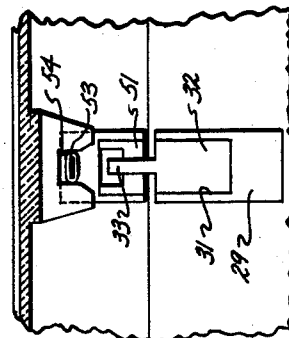
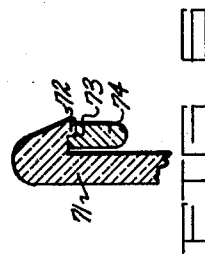
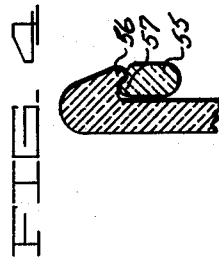
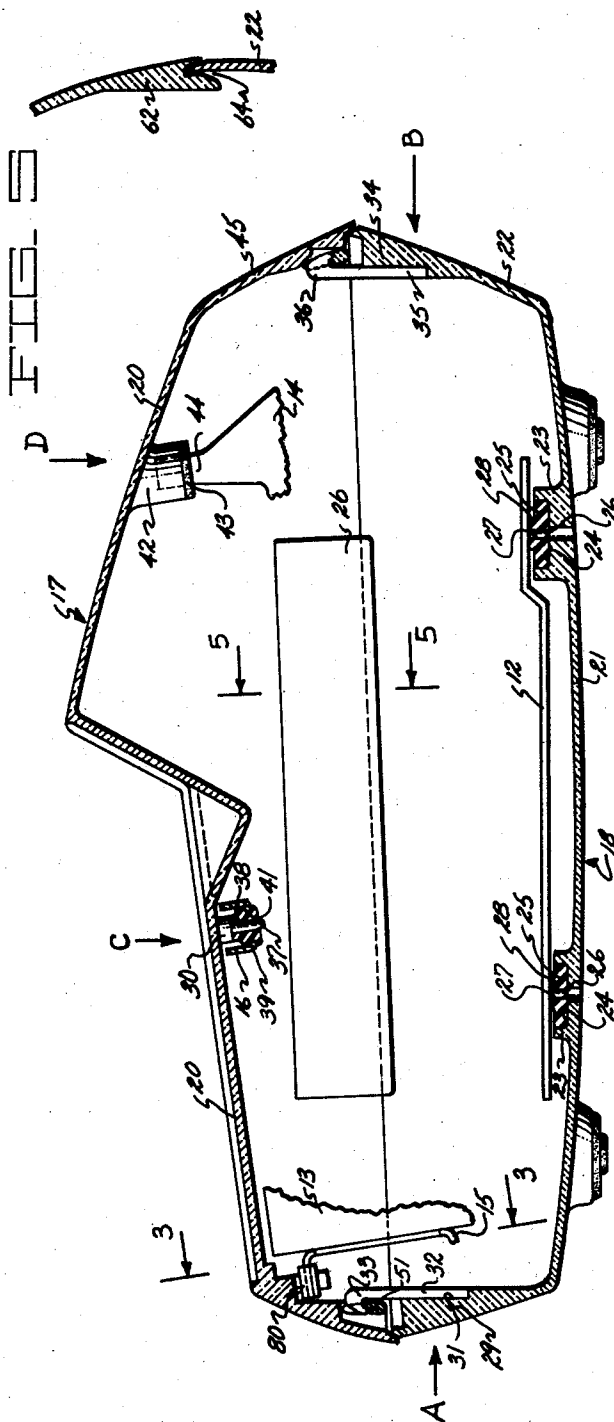


FIG. 9

FIG. 10

INVENTOR
KENNETH F. OLDENBURG
DOMINICK FAZIO
BY *Paul E. Schumacher*
ATTORNEY

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HOUSING FOR BUSINESS MACHINE

Kenneth F. Oldenburg, Arcadia, and Dominick Fazio, San Gabriel, Calif., assignors, by mesne assignments, to Addmaster Corporation, San Gabriel, Calif., a corporation of California

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This invention relates to business machines and has particular reference to means for removably attaching housing or cover parts thereto.

As is well known, business machines such as adding and calculating machines require servicing and repair from time to time, thus necessitating removal of the housing therefor.

Heretofore, such housing parts have generally been removably held in place either by screws or by separate latching devices which have portions extending exteriorly of the machine whereby they may be manually actuated to release at least one of the housing parts so that it may be removed to permit access to the interior of the machine.

Such screws and/or latching devices not only detract from the appearance of the machine when they are visible from the exterior but also increase the cost of manufacture and assembly of the machine.

It therefore becomes a principal object of the present invention to removably secure the housing parts of a business machine in place without the use of exposed screws or latching devices.

Another object is to obviate the need for separate fastening devices for attaching the housing parts of a business machine in place.

Another object is to utilize the resiliency of a resilient housing part to effect attachment and detachment of the housing part to and from the chassis or frame of a business machine.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification, wherein:

FIG. 1 is a plan view of an adding machine embodying a preferred form of the present invention.

FIG. 2 is a longitudinal sectional view illustrating the means for mounting the machine in the housing parts or sections and the latching arrangement for locking the housing sections together.

FIG. 3 is a transverse sectional view taken along the line 3—3 of FIG. 2.

FIG. 4 is an enlarged sectional view of one of the cooperating latch and latching shoulder combinations.

FIG. 5 is a transverse sectional view taken along line 5—5 of FIG. 2.

FIG. 6 is a sectional view, similar to FIG. 4, but illustrating a modified form of the invention.

Referring to the drawings, the details of the adding machine mechanism are omitted therein for the sake of brevity and clarity since such details are believed unnecessary. However, it should be noted that the machine mechanism is supported on a base plate 12 by a set of side frames, partly indicated at 13 and 14, on one side of the machine and a similar set of side frames on the opposite side of the machine. The side frames are suitably secured to the base plate 12.

The side frames 13 which support the keyboard section (not shown) are held in parallel relation through a pair of channel bars 15 and 16 attached thereto while the frames 14 for supporting the printer section (not shown) are also held in parallel relation by the channel bar 16 and a second channel bar (not shown).

The housing for the machine comprises an upper housing section generally indicated at 17 and a lower housing section generally indicated at 18, which sections are

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formed of a relatively resilient molded plastic material having high impact characteristics such as that known in the trade as "Polystyrene," a product of the Dow Chemical Company.

The lower housing section 18 comprises a bottom section 21 having substantially vertical side walls 22 therearound which enclose the lower section of the machine.

The bottom section 21 has four raised support bosses 23, FIGS. 1 and 2, having cavities 24 therein for retaining annular mountings 25 preferably of rubber. The latter have holes 26 therein for receiving locating pins 27 which project downward from the base plate 12 to position and locate said machine in said lower housing section.

A raised central portion 28 on each of the mountings 25 projects above the respective boss 23, thereby retaining the base plate 12 off the bosses 23 to allow the base plate to compress the mountings upon a downward pressure being applied to the top of the machine or upon vibration resulting from machine operation.

The front or foremost portion of the housing side wall 22 has integrally formed on its inner surface thereof a latch support block 29 having a relieved section 31 formed therein for receiving the base portion 32 of a latch 33. The portion 32 is integrally retained in the section 31 in some appropriate manner such as by the application of an epoxy glue. However, the latch 33 could alternatively be formed integrally with the rest of the housing during the molding process.

At the rear of the housing, on its inner surface, the wall 22 has a second latch support block 34 integral therewith which retains a base portion 35 of a second latch 36 in the same manner as the forwardly located support block.

The upper housing section 17 has integrally formed on a top section 20 thereof a pair of bosses 30 supporting pins 37 which extend into holes 38 in a set of grommets 39 formed of a resilient material, such as rubber, which are retained in openings 41 in the channel bar 16.

A pair of bosses 42 are integrally formed on the inside of the housing 17 towards the rear thereof. The latter bosses have tips 43 formed of a resilient material, such as rubber, mounted thereon which rest against upstanding stems 44 on the side frames 14.

A skirt or side wall 45 integrally formed on the top section 20 extends downwardly to mate with the side wall 22 of section 21, thereby encasing the machine. It will be noted that the lower edge of the skirt overlaps the upper edge of the side wall 22 to effectively seal off the interior of the housing at the juncture of the two housing sections.

A pair of latch shoulder supports 46 and 47 are integrally formed on the inside of side wall 45 adjacent respective latches 33 and 36, and have recesses 48 and 49 for receiving latching shoulder inserts 51 and 52, respectively, which are held in position in the same manner as the latches. However, the latch shoulders could be formed integrally with the upper housing section during molding of the latter.

The upper housing latch shoulder 51 is guided for alignment with its respective latch during assembly of the upper housing section by an extension 53, FIGS. 2 and 3, of the channel bar 15, which extension projects toward the front of the machine into the path of a guide slot 54 integrally formed in the upper housing section. This alignment also helps align the pins 37 with the holes in the grommets 39.

When assembling the upper housing section in place, the guide slot 54 is fitted over the extension 53 and the pins 37 are aligned with the holes in the grommets 39. The upper housing section is then pressed downwardly to cause camming surfaces 55 formed on the bottoms of the latch shoulders, FIG. 4, to cam against inclined surfaces

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on the latches 33 and 36, thereby flexing the side wall 22 of the lower housing section inwardly in the vicinity of the latches to allow each latch shoulder 55 to drop below a rounded nose 56 of the associated latch. During this flexing movement, the skirt of the upper housing section also flexes outwardly somewhat.

At the same time that the shoulders 55 clear the latches, the sides 22 will snap back to their original positions which will place the noses 56 in latching position behind rounded lips 57 of the latch shoulders.

The downward pressure applied to housing section 17 in assembling the same in place will compress the resilient grommets 39 and the resilient tips 43 and will likewise cause the base plate 12 to compress the mountings 25 slightly. Upon release of applied pressure on the housing section 17 the resilient members will rebound until the latches and respective latch shoulders lock together, as seen in FIG. 4, thereby locking the housing sections together, while the partially compressed resilient members will hold the machine suspended from the housing thereby preventing transmission of noise of the machine from traveling to the housing.

It should be noted that the extension 53 for guiding the upper section also carries a resilient protector 50, such as rubber, to prevent noise transmission to the housing.

To remove the upper housing section for gaining access to the machine, finger pressure is applied at points on the side wall 22 indicated by arrows A and B in FIGS. 1 and 2, causing the round noses 56 of the latches to slip over the round portions 57 of the latching shoulders, thereby allowing the resilient members to fully rebound to lift the latching shoulders clear of the latches.

Since the longitudinal sides of the housing sections have a relatively long span it is desirable that flexing thereof be restricted. For this purpose, stiffening sections 62 and 63 are formed on the side walls of the upper housing section 17 as seen in FIGS. 1 and 5. Grooves 64 formed in the lower edges of such sections 62 and 63 receive the upper edges of the side walls 22 of the lower housing section. Thus, the stiffening sections 62 and 63 effectively stiffen the longitudinal sides of both the upper and lower housing sections.

An alternate shape of latch and latch shoulder construction is shown in FIG. 6, wherein each latch 71 has a squared nose 72 which locks with a mating square portion 73 on a latching shoulder 74 to thereby provide a more positive lock.

To remove the upper housing section with this alternate form of latching arrangement, pressure must first be applied in a downward direction at points indicated by arrows C and D (FIG. 2) to compress the resilient members 25 and 39 and to move the shoulder portion 73 below the latch nose 72. Thereafter, pressure must be applied at the points indicated by arrows A and B to move the latches beyond reach of the latch shoulders. Then, release of pressure on the upper housing section will allow the resilient members to rebound, clearing the shoulders of the latches.

Although the invention has been described in detail and certain specific terms and languages have been used, it is to be understood that the present disclosure is illustrative rather than restrictive and that changes and modifications may be made without departing from the spirit or scope of the invention as set forth in the claims appended hereto. For example, the invention may be embodied in machines other than adding machines, such as calculating machines, cash registers, typewriters, etc.

Having thus described the invention, what is desired to be secured by United States Letters Patent is:

1. In a business machine including a machine frame; a lower housing part enclosing part of said frame, said housing part having a flexible side wall, resilient means supporting said frame on said housing part, an upper housing part enclosing the remainder of said frame, said upper housing part having a side wall, second resilient means

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mounting said upper housing part on said frame, means on said side wall of said upper housing part forming a latching shoulder, and means on said side wall of said lower housing part forming a latch, said latch and said latching shoulder having interlocking portions, said latch and said latching shoulder being normally concealed by said housing parts, and said latch being releasable from said latching shoulder to permit removal of said upper housing part from enclosing relation with said frame by forcing said housing parts together against said resilient means whereby to release said interlocking portions and by flexing portion of said side wall of said lower housing part adjacent said latch inwardly toward said frame.

2. In a business machine including a machine frame; a first housing part enclosing part of said frame, said housing part having a first side wall, resilient means intermediate said frame and said housing part, a second housing part enclosing the remainder of said frame, said second housing part having a second flexible side wall, second resilient means intermediate said frame and said second housing part, means on said first side wall forming a latching shoulder, and means on said second side wall forming a latch, said latch and said latching shoulder having interlocking portions, said latch and said latching shoulder being normally concealed by said housing parts, and said latch being releasable from said latching shoulder to permit removal of one of said housing parts from enclosing relation with said frame by forcing said housing parts together against said resilient means and by flexing a portion of said second side wall adjacent said latch inwardly toward said frame.

3. In a business machine including a machine frame; a first housing part enclosing part of said frame, said housing part having a first side wall, a second housing part enclosing the remainder of said frame, said second housing part having a second flexible side wall, means on said first side wall forming a latching shoulder, a latch integral with said second side wall, said latch and said latching shoulder having interlocking portions, said latch and said latching shoulder being normally concealed by said housing parts, resilient means mounting said first housing part on said frame, and said latch being releasable from said latching shoulder to permit removal of said first housing part from enclosing relation with said frame by moving said first housing part against said resilient means whereby to unlock said interlocking portions and by flexing a portion of said second side wall adjacent said latch inwardly toward said frame.

4. In a business machine including a machine frame; a first housing part enclosing part of said frame, said housing part having a first side wall, a second housing part enclosing the remainder of said frame, said second housing part having a second flexible side wall, means on said first side wall forming a latching shoulder, and a latch integral with said second side wall, said latch normally engaging said latching shoulder, said latch and said latching shoulder being normally concealed by said housing parts, and said latch being releasable from said latching shoulder to permit removal of said first housing part from enclosing relation with said frame by flexing a portion of said side wall of said second housing part adjacent said latch inwardly toward said frame.

5. In a business machine including a machine frame; a first housing part enclosing part of said frame, said housing part having a side wall, a second housing part enclosing the remainder of said frame, said second housing part having a side wall, one of said side walls being flexible, means on one of said side walls forming a latching shoulder, and a latch integral with the other of said side walls and normally engaging said latching shoulder, said latch and said latching shoulder being normally concealed by said housing parts, and said latch being releasable from said latching shoulder by flexing a portion of said flexible side wall adjacent said latch toward said frame.

6. In a business machine including a machine frame; a

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first housing part enclosing part of said frame, a second housing part of flexible material enclosing another part of said frame, means on said first housing part forming a latching shoulder, and a latch integral with said second housing part and normally engaging said latching shoulder whereby to maintain said first housing part in cooperative relation with said second housing part, said latch and said latching shoulder being normally concealed by said housing parts, and said latch being releasable from said shoulder by flexing a portion of said second housing part adjacent said latch inwardly toward said frame.

7. In a business machine including a machine frame; a first housing part enclosing part of said frame, a second housing part of flexible material enclosing another part of said frame, means on said first housing part forming a latching shoulder, and a latch integral with said second

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housing part and normally engaging said latching shoulder whereby to maintain said first housing part in cooperative relation with said second housing part, said latch being releasable from said shoulder by flexing a portion of said second housing part adjacent said latch inwardly toward said frame.

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