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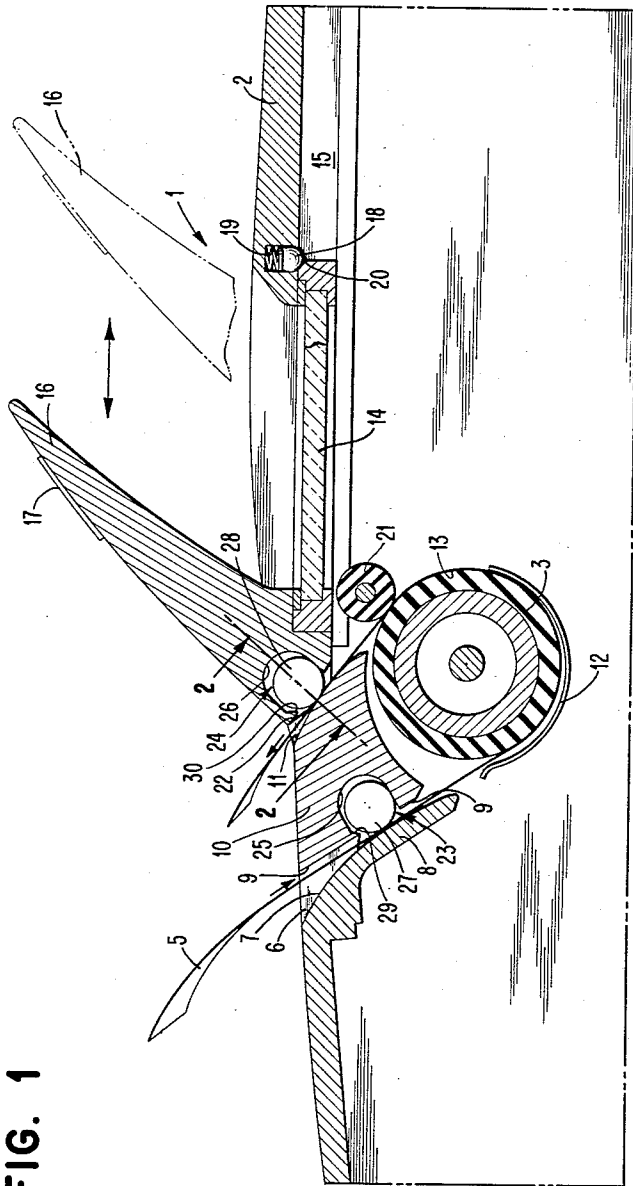
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3,122,228

PAPER SLOT ACOUSTICAL SEAL

Filed Feb. 16, 1961

2 Sheets-Sheet 1



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FIG. 2

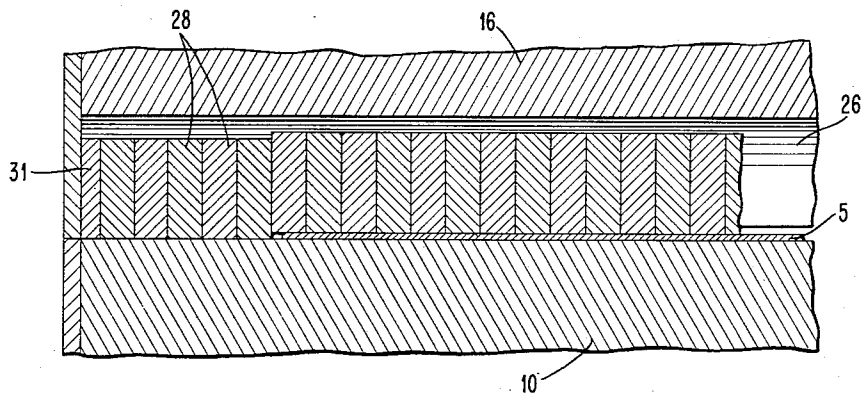
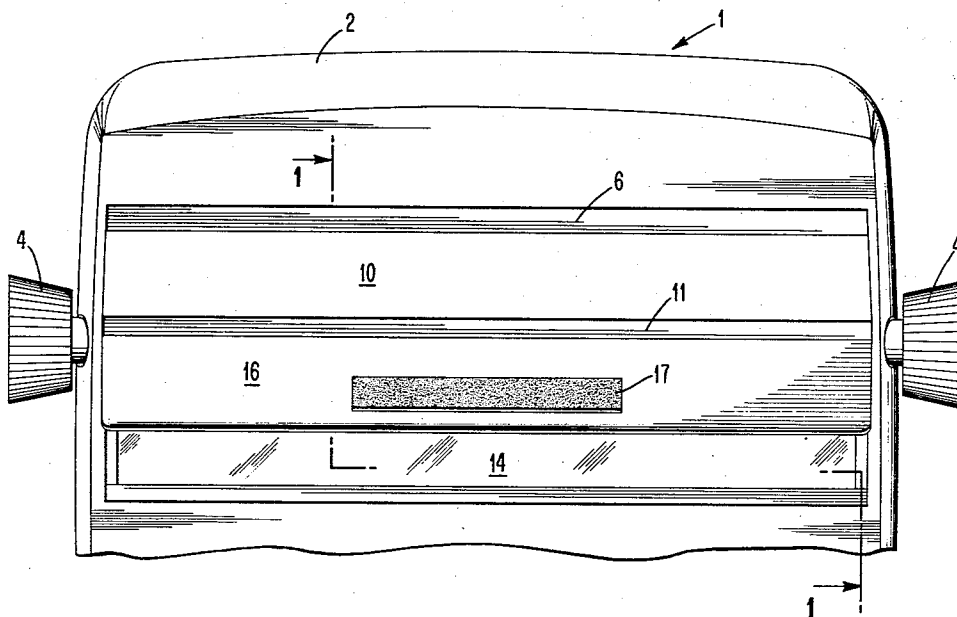


FIG. 3



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PAPER SLOT ACOUSTICAL SEAL

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This invention relates to office machines such as typewriters and the like which make an imprint on a removable sheet of paper, and more particularly to an acoustical seal for the housings or enclosures containing the working parts of the machine.

In the operation of many office machines, a character, which may be an alphabetic letter or a number, is imprinted on a piece of paper. The imprint results from the impact between a member carrying the character and the paper which is backed by a relatively rigid paper carrying member such as a roller or platen. To permanently mark the paper with the character, an inked or carbonated tape is interposed between the paper and character carrying member at the moment of impact.

In the usual case, for making the proper imprint, the required impact must be so intense that impact producing mechanism produces a significant sound and in cases where the machine is operated continually, the sound produced can be very distracting to individuals in the vicinity of the machine. Such vicinity can include an entire room containing a relatively large number of office workers at desks, for example. Various constructions of impacting members of machines, particularly typewriters, have been proposed for minimizing such noise. Such arrangements have been effective to some extent, however, they still produce a significant amount of noise in the vicinity of the machine to the distraction and discomfort of individuals in the vicinity. When such individuals are workers, the effect of the noise is clearly a loss in efficiency of the workers compared with an environment wherein the machine could not be heard.

It is accordingly a principal object of this invention to facilitate the operation of office machines, such as typewriters, without producing a level of noise which would be distracting to individuals such as office workers at desks immediately adjacent to that at which the machine is operated.

It is another object of the invention to facilitate the easy insertion, removal and continual circulation of a sheet of paper through an office machine while maintaining its interior continuously acoustically sealed from space ambient to the machine.

The foregoing and other objects, features, and advantages of the invention will be apparent from the following more particular description of a preferred embodiment of the invention, as illustrated in the accompanying drawings.

FIGURE 1 is an enlarged view of a typewriter incorporating the invention and taken along section 1-1 of FIGURE 3,

FIGURE 2 is an enlarged view taken along section 2-2 of FIGURE 1, and

FIGURE 3 is a cut-away, plan view of the typewriter incorporating the invention.

Referring now more particularly to the drawings for a detailed description of the invention, 1 represents an entire machine in which the invention may be utilized. Although the machine 1 is shown as being a typewriter of the non-carriage type and the following description is specific to the typewriter shown, it is to be understood that this is purely for convenience and simplicity in explanation and that the invention is equally applicable to office machines other than such typewriters. The op-

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erating parts and mechanisms of the machine 1 are contained in an enclosure or housing 2. A keyboard of any conventional construction is provided for operation thereof but such a keyboard is not shown because it forms no essential part of the present invention.

A paper carrying member, such as a circular, elongated roller or platen 3 is mounted in fixed longitudinal position in the machine and for rotation of the platen, an external knob 4 is mounted at each end of a reduced portion of the platen which passes externally through the enclosure 2. The platen forms a backing for a sheet of paper such as shown at 5, to facilitate imprinting of characters on the paper by impact by a member carrying the character, not shown.

The paper 5 is accommodated by a slot 6 formed between one surface 7 of a flange member 8 extending inwardly from the machine enclosure 2 and an adjacent surface 9 of a member 10 secured with respect to the enclosure 2. The flange 8 and member 10 are substantially coextensive with the platen 3 whereby a sheet of paper having a width substantially equal to the width of these members may be used in the machine. The paper 5 is fed into the machine at slot 6, passes around a portion of the circular periphery of platen 3 and then outwardly along another surface 11 of member 10. A curved paper guide 12 mounted beneath the platen aids in guiding the paper.

In the operation of the typewriter 1, an imprint is made on the paper 5 by impact between a character carrying member and the paper. Along the portion of the paper designated 13, a suitable tape is interposed between these members in a known manner. Such an impact may produce a relatively loud sound which is usually distracting to individuals in the vicinity of the typewriter.

To aid in confining the sound of the described impact within the enclosure 2, a sliding door 14 is mounted in the enclosure 2. Opposite sides of the door are slidable in grooves such as that shown at 15 for guiding the door in its sliding movement forwardly and rearwardly with respect to the enclosure. The door 14 is movable from a position as shown in FIGURE 1 of the drawings to a position as shown in phantom in this figure, to facilitate access to the paper and platen as may be desirable, for example, in inserting the paper in the machine. An upwardly and rearwardly projecting wing 16 with an attached friction member 17 is provided for manipulating the door. In the closed position shown, the door is relatively securely held by a ball detent 18 biased by a spring 19 mounted in a recess in enclosure 2 and urging the ball detent into engagement with a chamfered surface 20 at an end of the door 14. To aid in holding the paper 5 snugly against the platen 3, a roller 21 is fixedly secured and firmly presses the paper against the platen. The paper passes out of the machine between the surface 11 and an inclined surface 22 at the forward end of the door 14.

In accordance with the invention, the escape of the sound of the impact between the characters and the platen backed paper from the interior of the typewriter 1 is very effectively minimized by the provision of a pair of acoustic seals shown generally at 23 and 24, respectively, for isolating the interior of the typewriter from ambient space at the slots formed between pairs of surfaces 7 and 9 and 11 and 22. These seals include respective recesses 25 and 26 in respective surfaces 9 and 22. The recesses are substantially co-extensive with the platen 13 and in accordance with a feature of the invention each recess accommodates a plurality of members having slightly curved paper engaging surfaces. Preferably, the members are circular, cylindrical rollers designated 27 and 28 respectively. One plurality of these is shown

clearly at 28 in FIGURE 2 of the drawings. The individual rollers in pluralities of rollers 27 and 28 are preferably of uniform diameter and thickness and in endwise abutment with each other. The rollers are preferably made of a metal such as steel although many other metals or even other materials may be utilized.

The recesses 25 and 26 are provided with respective lips 29 and 30 to reduce the mouth portions of the recesses to dimensions smaller than the diameters of the rollers for preventing escape of the rollers. Remote from these lips, however, the recesses are somewhat larger than the diameters of the rollers and are deep enough to receive the rollers so that the same may be freely retracted well away from the respective opposed surfaces 7 and 11. In addition, each recess is inclined in a direction away from the mouth thereof whereby in the operating position of the typewriter as shown in FIGURE 1 of the drawings, the rollers are urged under the influence of gravity, toward the mouths thereof and toward the respective surfaces 7 and 11. Thus, it is to be understood that the rollers in the position shown in FIGURE 1 are in firm abutment with the paper 5 and thus, seal the space which would otherwise exist in the slots formed by pairs of surfaces 7, 9 and 11, 22 to prevent the escape of sound therefrom.

The manner in which the rollers engage the paper 5 is shown in FIGURE 2 of the drawing. It is to be particularly noted that the individual rollers are sufficiently narrow to conform to and accommodate incremental widths of a piece of paper or group of papers in the typewriter and thus, effectively accommodate a paper which may have irregularities along its surface. Also, the rollers are sufficiently light so as not to interfere with the free passage of the paper 5 in the typewriter but yet are sufficiently heavy to firmly engage the paper to close any space therebetween. The rollers are in close end-wise spacing with respect to each other but are loose enough to allow individual movement of each. To prevent excessive spacing between the rollers and the edge of the recesses, a single roller 31 of different thickness from that of rollers 27 or 28 may be provided between the end roller of either plurality and the recess end.

In accordance with a modification of our invention, magnetic means rather than the force of gravity may be exploited to urge the rollers 27 and 28 against the opposed surfaces described. To this end, the opposed members such as flange 8 and the portion of member 10 near the surface 11 may be permanent magnets and the rollers made of magnetizable material. In this event, the portion of member 10 enclosing the rollers 27 would be non-magnetizable. Also, in this modification, the incline of recesses 25 and 26 is rendered unnecessary.

It is to be further noted that while the seals described are effective in preventing the escape of sounds propagated through the air, the same also have a damping effect on the transverse vibrations which may exist in the paper 5.

It is seen according to the foregoing description that an effective acoustical seal adaptable to office machines for minimizing the escape of sound from within the confines of the machine is set forth.

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. In a paper handling machine having a casing in which a door is arranged to provide access to its interior, the combination of:

means providing a slot at one end of said door through which a sheet of paper may be fed by a paper carrying member spaced at a distance from said slot, said means comprising a surface on said casing and a complementary surface at one end of said door, one of said surfaces being recessed;

a plurality of members disposed in endwise abutment in said recess and having at least one side with a cylindrically curved surface;

and a lip adjacent said recess for reducing a portion of the recess to prevent the escape of the members when said door is opened but permitting a sufficient movement of the members out of the recess so that a continuous cylindrically curved surface engages the other slot surface and closes the slot when the door is closed, said members being individually retractable by the paper feeding through the slot so as to permit easy passage of the paper therethrough while maintaining an acoustical seal along the entire length of the slot regardless of the width of the paper.

2. The combination of claim 1 wherein said casing is provided with a second slot having opposed surfaces sufficiently spaced apart to permit the passage of paper therethrough and with one of the surfaces having a recess formed therein, and wherein a second acoustical seal is provided by a plurality of individually retractable members deposited in endwise abutment in said recess and having at least one side with a cylindrically curved surface so that a continuous cylindrically curved surface engages the other slot surface.

3. The combination of claim 1 wherein said members are made of a magnetizable material, and wherein said other slot surface is permanently magnetized in order to urge said members toward engagement therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

370,207	Negroponte	Sept. 20, 1887
821,353	Funk	May 22, 1906
1,198,227	Hinchey	Sept. 12, 1916
1,547,630	Waldheim	July 28, 1925
1,559,135	Waldheim	Oct. 27, 1925
1,609,435	Smith	Dec. 7, 1926
1,617,695	Waldheim	Feb. 15, 1927
1,783,305	Olson	Dec. 2, 1930
2,164,227	Britten	June 27, 1939
2,727,650	Moynihan et al.	Dec. 20, 1955
2,840,408	Scott et al.	June 24, 1958