Dec. 6, 1955 G. PROLL 2,725,779

MOLDED ALL PLASTIC INTEGRAL MUSICAL REED CONSTRUCTION

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FIG. 11.

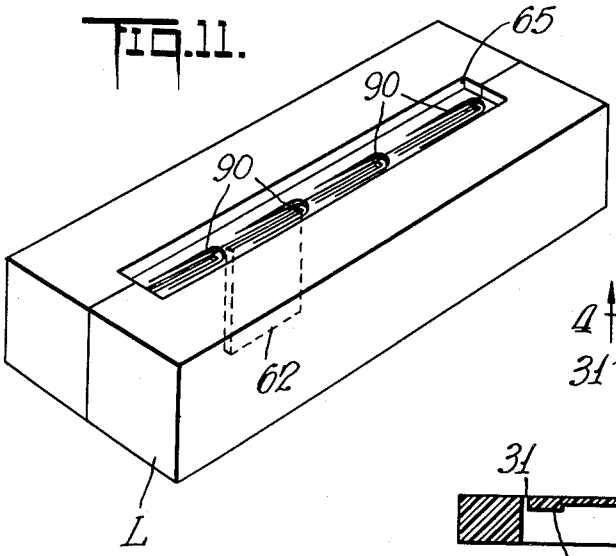


FIG. 3.

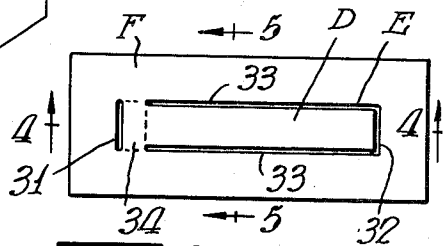


FIG. 4.

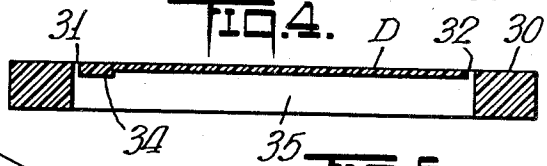


FIG. 12.

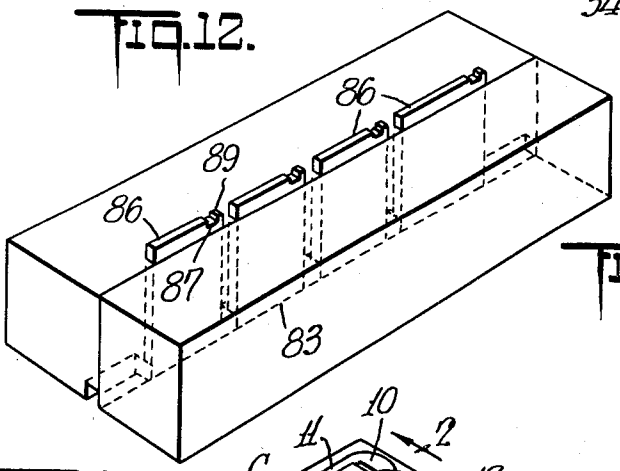


FIG. 5.

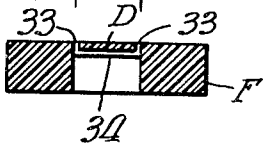


FIG. 6.

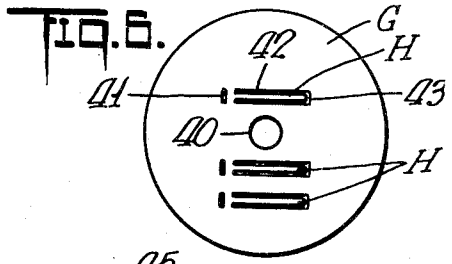


FIG. 1.

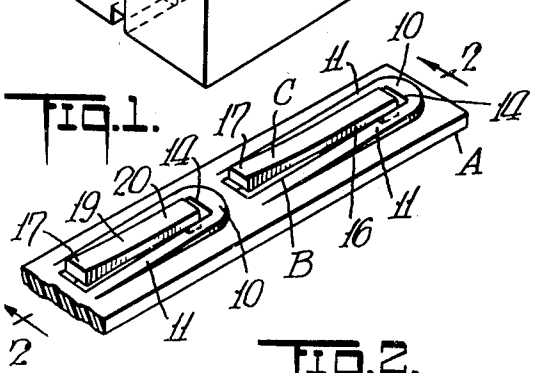


FIG. 7.

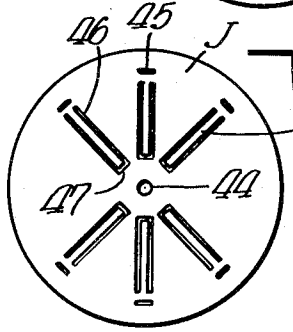
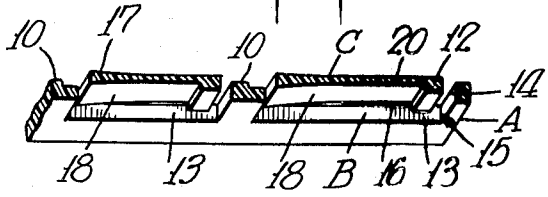


FIG. 2.



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Fig. 8.

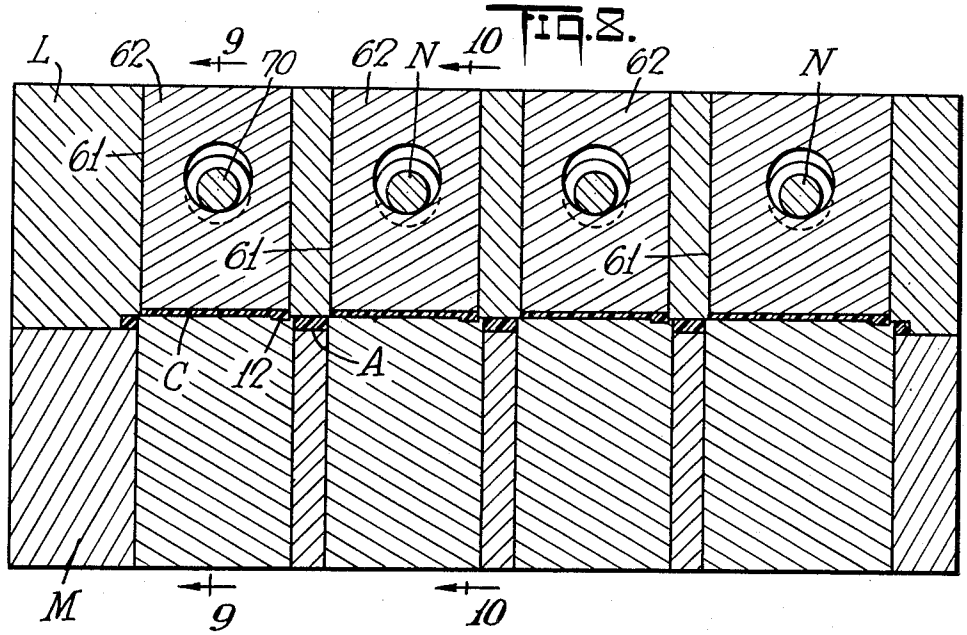


Fig. 9.

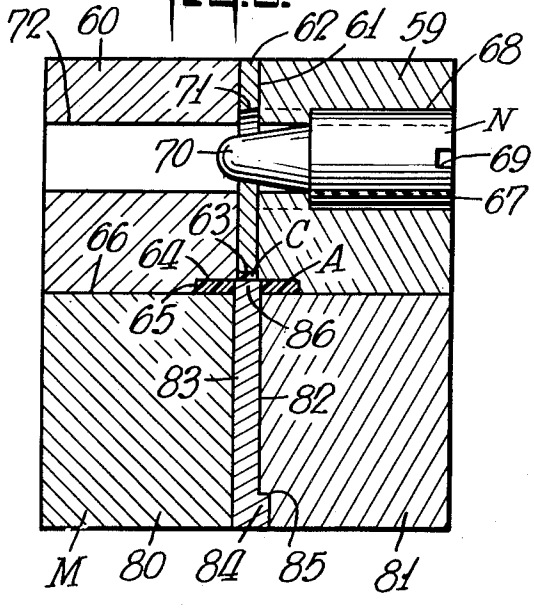
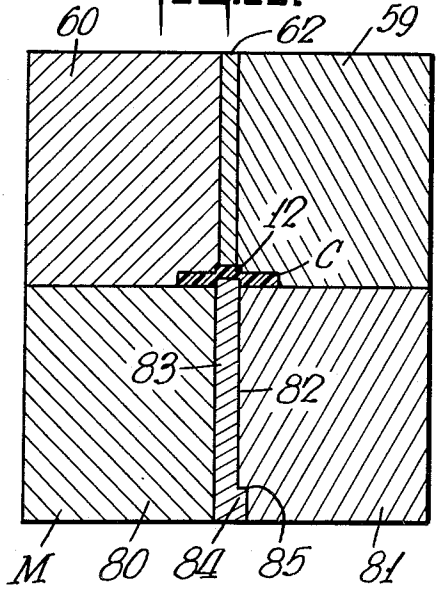


Fig. 10.



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MOLDED ALL PLASTIC INTEGRAL MUSICAL REED CONSTRUCTION

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Application June 16, 1952, Serial No. 293,738

12 Claims. (Cl. 84—360)

The present invention relates to a novel molded musical reed construction and it particularly relates to a novel all plastic molded reed construction and to a process for making the same.

It is among the objects of the present invention to make a superior, properly tuned reed by a molding operation as, for example, by injection molding in one step, with assurance that the molded reed will be integrally formed with its supporting carrier or reed plate, and with further assurance that the reed will be accurately tuned and will give a predetermined pitch.

Another object is to provide a reed and a novel process and mold for making the same in which the plastic reed will be so shaped, sized and formed as a result of an integral molding operation with the carrier or reed plate that the reed may be promptly set in vibration to give a predetermined musical sound without undue exertion by the person playing the musical instrument.

Another object is to provide a novel molded musical reed construction which is readily adaptable to all types of wind and musical instruments such as harmonicas, horns, toy animals or doll voices, accordions and the like.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects according to one embodiment of the present invention, the reed is integrally mounted as a result of a molding operation in a slot in the carrier or reed plate, but at the same time there is provision that the air which will pass the reed and set the reed in vibration shall be free to flow past the reed on at least four sides so that there will be no blocking and so that the reed will be more readily set into proper vibration and give the desired tune or tone.

In one embodiment of the present invention the reed is mounted in the reed slot in such a manner that the heel will not be attached to the end of the reed slot but will be spaced from the end of the reed slot so as to provide a substantial air channel at such end. As a result the air in blowing or drawing will be pulled past both ends of the reed as well as along the sides of the reed.

Desirably the reed is mounted in the slot adjacent the end thereof at the sides of the reed with the end of the reed being free of such attachment. These reeds may be molded in side by side relationship or end to end relationship in a single plastic plate, or they may be molded in a disk either in parallel relationship or in radial relationship.

Desirably the plate may be made so that it has a greater thickness adjacent the heel of the reed and adjacent the end of the reed so that the reed will gradually

project out of the slot as the thickness of the surrounding plastic material decreases.

To give the reed its proper vibrational characteristics the reed preferably is made of changing thickness from front to rear with the thickness gradually increasing from the heel end to the free end.

Desirably the reed is made in a mold which has separate adjustable members for forming the reeds and slots and for forming the balance of the plate. This adjustment may be achieved by means of a concentric which will adjust the thickness of the reed by adjusting the thickness of the cavity for the reed.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

Fig. 1 is a fragmentary top perspective view of one type of reed plate with the reeds proportioned in longitudinal end to end relationship and with the reeds gradually emerging from the slot as they are removed from their heel ends.

Fig. 2 is a transverse longitudinal sectional view upon the line 2—2 of Fig. 1.

Fig. 3 is a bottom plan view of an alternative reed construction showing a single reed mounted in a carrier or plastic plate.

Fig. 4 is a transverse longitudinal sectional view upon the line 4—4 of Fig. 3.

Fig. 5 is a transverse cross sectional view upon the line 5—5 of Fig. 3.

Fig. 6 is a top plan view of a disk having reeds molded integrally therein in parallel relationship.

Fig. 7 is a plan view of a disk having reeds molded integrally therein in a radial relationship.

Fig. 8 is a transverse sectional view of an injection molding construction which will be utilized for forming the reed plate of Fig. 1.

Fig. 9 is a transverse sectional view upon the line 9—9 of Fig. 8.

Fig. 10 is a transverse sectional view upon the line 10—10 of Fig. 8.

Fig. 11 is a top perspective view of the lower face of the upper portion of the mold of Fig. 8.

Fig. 12 is a top perspective view of the meeting face of the lower portion of the mold of Fig. 8.

Referring to Figs. 1 and 2 there is shown a reed plate A having the reed slots B and the reeds C. As is indicated the plate A may be formed of a flat bar of plastic material such as polystyrene or other suitable plastic which is injection molded integrally with the reed C.

The reed plate A is formed with a series of slots B and around the slots is a thickened or increased depth or thickness portion 10, having the end extensions 11 also molded integrally with the reed.

The reed C itself is provided with a heel portion 12 of increased thickness which is molded integrally into the sides 13 of the slot B. This heel 13 terminates short of the end of the slots B, as indicated at 14, so as to leave a gap or air space 15 through which the air may flow either in blowing or drawing.

The reed itself will project forwardly with its sides 16 closely adjacent to the sides 13 of the slot, and it will gradually come out of the slot as indicated at 17 in Figs. 1 and 2.

Both the under surface 18, and if desired the upper

surface 19, may be curved so that the reed will have a minimum thickness at 20 adjacent its heel end and a maximum thickness at 17 adjacent its free end.

In the embodiment of Figs. 3 to 5 there is shown a single reed D molded so that it will be positioned in the slot E in the plate F. The reed D in this embodiment is positioned so that it will lie substantially flush with the top of the reed plate F so that about the same width will be provided in the heel slot 31, the end slot 32 and the side slots 33.

The heel portion 34 is of increased thickness and it will be integrally joined to the sides 35 of the slot E. In both the embodiment of Figs. 1 and 2 and 3 to 5 the air in drawing or blowing may pass on four sides of the reeds and it will more readily set the reed in vibration without jamming or blocking.

In the embodiment of Fig. 6 there is shown a plastic disk G with the reeds H. The disk has a central mounting opening 40 and each of the reeds are provided with the heel slot 41, the side slots 42 and the end slot 43.

In the disk J of Fig. 7 there are a plurality of radially disposed reeds K. The disk J is provided with a central mounting opening 44 and the reeds K are each provided with a heel slot 45, the end side slots 46 and the end slot 47.

The detail reed construction of Figs. 6 and 7 may be the same as Figs. 1 and 2 or the same as Figs. 3 to 5.

In the mold construction of Figs. 8 to 10 there is provided an upper mold structure L and the lower mold structure N. The upper mold section has two half structures 59 and 60 between which are formed a plurality of recesses 61 for receiving the upper adjustable plate members 62.

These plate members 62 have end faces 63 which will be normally positioned below the bottom face 64 of the recess 65. The recess 65 is formed below the meeting face 66 of the upper and lower mold sections L and M. The plates 62 are adjustable upwardly and downwardly by the eccentric arrangement N.

The eccentric arrangement N consists of a cylinder 67 which fits in a cylindrical recess 68 in the upper mold half of section 59.

The cylinder 67 has a fillister slot 68 adjacent one side of the mold and at the other side of the mold there is a conical nose 70 which bears in an eccentric recess 71 in the plate 62.

By turning the cylinder 67 it is possible to adjust the position of the plate 62 to increase or decrease the thickness of the reed C.

The other reed section 60 has an opening at 72 by which the nose 70 projects through the plate 62 into the opposite upper half section 60 as shown in Fig. 9.

In Fig. 10 there is shown the heel section 12 being molded between the upper and lower sections L and M.

The lower mold structure M also has two half sections 80 and 81 which form recesses 82 receiving the lower blades 83 provided with shoulders 84. These shoulders fit in the recesses 85 in the lower mold half sections 81.

The mold halves L and M after separation are better shown in Figs. 11 and 12. The reed plates after molding, as shown in Figs. 8, 9 and 10, may be readily ejected from the cavity or recess 65 of Fig. 11 and separated from the projecting portions 86 at the ends of the plates 83. It will be noted that the projecting portions 86 have recesses at 87 to form the heels 12 and end projects 89 to form the heel slots 14, 31, 41 and 45.

In Fig. 11 there will be recesses 90 formed around each reed slot at the bottom of the recess 65 to form the extra thickness portions 10—11 of the reed plate A. The thickness and shape of the reed plate then may be readily achieved by adjustment of the plates 62.

It is thus apparent that the applicant has provided a novel reed structure in which the reed may be readily formed in one single molding operation and in which the reeds are designed so as to start more readily without choking.

These reeds are particularly designed for children's toys where the child may blow too hard in order to obtain the musical or harmonica effect and in general the fewer the vibrations the wider the heel slot should be.

The applicant's construction gives an unusual balanced reed not previously achieved.

As many changes could be made in the above molded all plastic integral musical reed construction and method of making the same, and many widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed, what is claimed is:

1. A molded integral plastic reed construction having a reed carrier formed of a flat injection molded plastic plate with edges and being provided with a rectangular slot extending entirely through the thickness of the body of the carrier and said slot terminating short of the edge of the carrier, said slot having short end walls and elongated side walls and a plastic reed with a heel and a free end positioned in said slot and with the heel mounted by extensions in the side walls of the slot adjacent one end wall of the slot and spaced from the end of the slot.

2. A molded integral plastic reed construction having a reed carrier formed of a flat injection molded plastic plate with edges and being provided with a rectangular slot extending entirely through the thickness of the body of the carrier and said slot terminating short of the edge of the carrier, said slot having short end walls and elongated side walls and a plastic reed with a heel and a free end positioned in said slot and with the heel mounted by extensions in the side walls of the slot adjacent one end wall of the slot and spaced from the end of the slot, said reed construction having air slots on all four sides thereof so as to prevent choking.

3. A molded integral plastic reed construction having a reed carrier formed of a flat injection molded plastic plate with edges and being provided with a rectangular slot extending entirely through the thickness of the body of the carrier and said slot terminating short of the edge of the carrier, said slot having short end walls and elongated side walls and a plastic reed with a heel and a free end positioned in said slot and with the heel mounted by extensions in the side walls of the slot adjacent one end wall of the slot and spaced from the end of the slot, said construction having the reeds formed so that they will gradually project out of the slots towards their end portions.

4. A molded integral plastic reed construction having a reed carrier formed of a flat injection molded plastic plate with edges and being provided with a rectangular slot extending entirely through the thickness of the body of the carrier and said slot terminating short of the edge of the carrier, said slot having short end walls and elongated side walls and a plastic reed with a heel and a free end positioned in said slot and with the heel mounted by extensions in the side walls of the slot adjacent one end wall of the slot and spaced from the end of the slot, said construction having a heel of increased thickness with the sides of the heel being molded integrally into the sides of the slot and with the heel portion being of increased thickness.

5. A molded integral plastic reed construction having a reed carrier formed of a flat injection molded plastic plate with edges and being provided with a rectangular slot extending entirely through the thickness of the body of the carrier and said slot terminating short of the edge of the carrier, said slot having short end walls and elongated side walls and a plastic reed with a heel and a free end

positioned in said slot and with the heel mounted by extensions in the side walls of the slot adjacent one end wall of the slot and spaced from the end of the slot, the upper and lower faces of said reed being curved so that the reed will be of greater thickness at the heel end.

6. A molded plastic reed plate comprising a reed plate having a slot formed therein, and a reed positioned in said slot having its ends spaced from the ends of said slot and with extensions from its side adjacent one of the ends of the reed extending integrally into the sides of the slot.

7. The plate of claim 6, both ends of the reed adjacent the ends of the slot being of greater thickness than the middle portion of the reed.

8. The reed plate of claim 6, said reed projecting gradually above said slot away from the heel end and the spacing along the sides and both ends of the reed permitting restricted flow of air around all four sides of the reed.

9. A one-piece integral all-plastic reed plate construction consisting of a flat plastic plate with an elongated slot therein and a thin rectangular reed integrally mounted to cover said slot, said reed being integrally connected to

said slot at the sides of the reed and the sides of the slot and being free of connection at the ends of the slot.

10. The construction of claim 9, said connections being limited to the heel end of the reed.

11. The construction of claim 9, said reed being thicker at its heel and toe ends and being thinner intermediate its heel and toe ends.

12. The construction of claim 9, said reed plate being of increased thickness at the sides and heel end of the slot.

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