July 11, 1939. R. H. HIERS 2,165,379

METHOD OF MAKING TOY DRUMS

Original Filed May 13, 1936 2 Sheets-Sheet 1

Fig. 1.

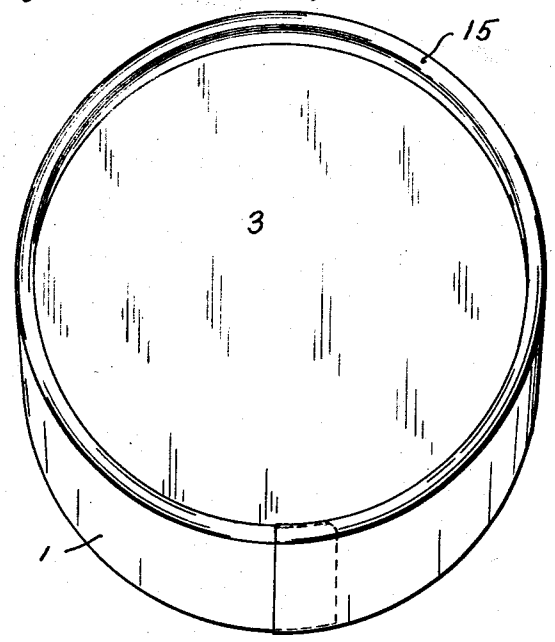
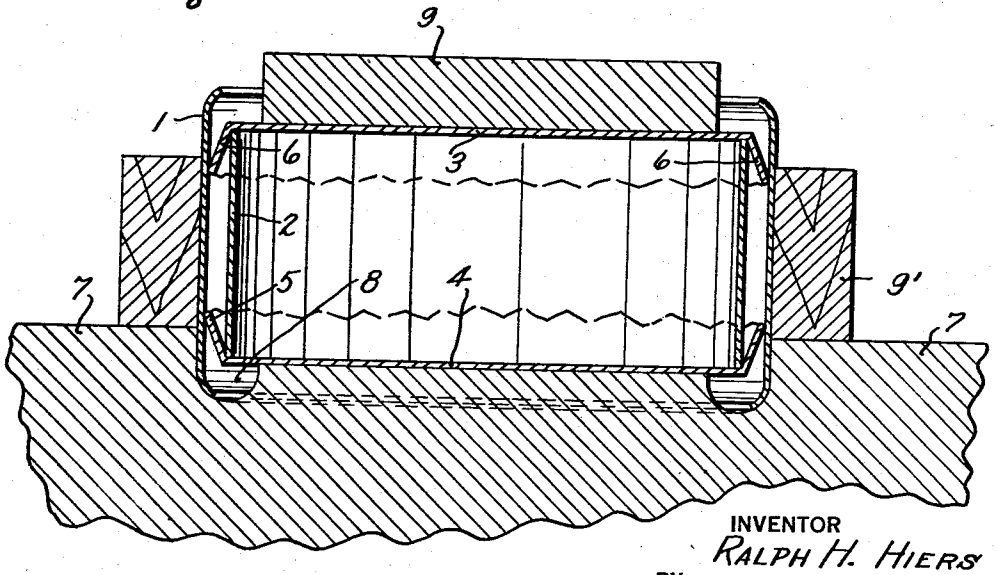


Fig. 2.



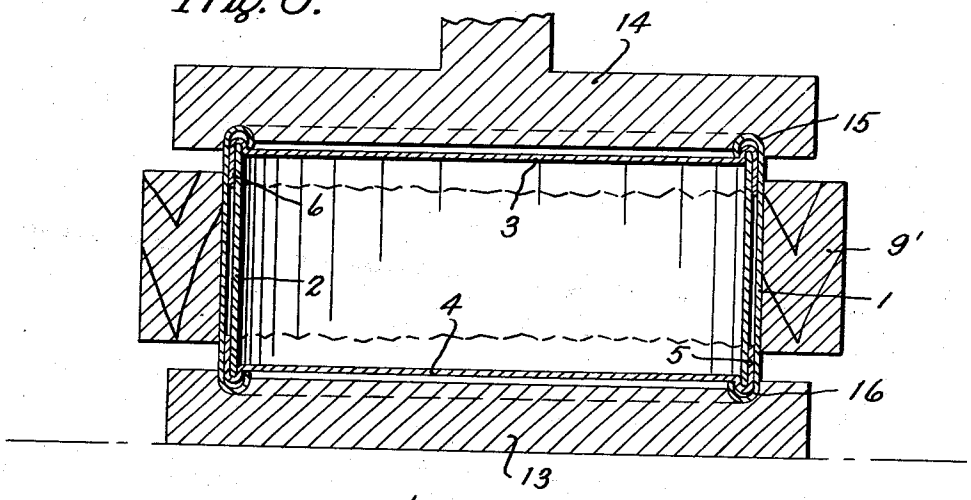
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Fig. 3.



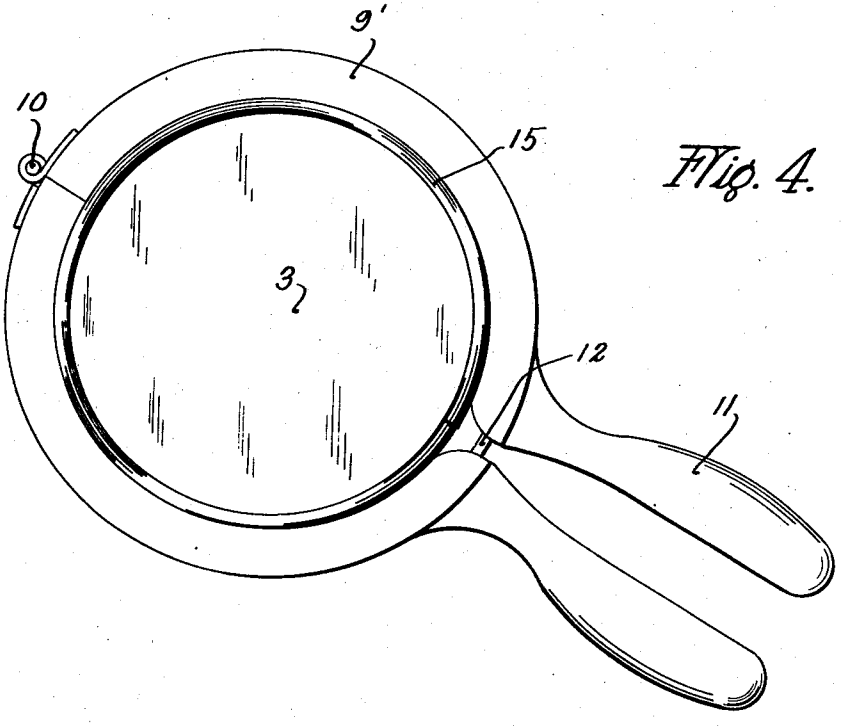


Fig. 4.

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2,165,379

METHOD OF MAKING TOY DRUMS

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Original application May 13, 1936, Serial No. 79,441. Divided and this application May 12, 1937, Serial No. 142,151

3 Claims. (Cl. 153—1)

This invention relates to an improved method of making toy drums. This application is a division of my copending application Serial No. 79,441, filed May 13, 1936.

The best prior method of manufacture of which I am aware is shown in my own Patent 1,783,843, December 2, 1930. That patent shows a diaphragm supporting structure and method of securing the diaphragm to the structure.

The present invention is directed to a method of securing two diaphragms simultaneously to a diaphragm supporting structure, one diaphragm at each end, so that a complete drum is made. It is cheaper to use this method of manufacture and the product is a simpler structure of better quality than with the prior art way.

For a disclosure of the invention I refer to the accompanying drawings, in which—

Fig. 1 is a general view of the complete drum;

Fig. 2 is a cross-section of the drum parts at an intermediate manufacturing stage and showing some of the tools;

Fig. 3 is a cross-section of the drum assembly as made in the final press; and

Fig. 4 is a plan view of a clamping tool used.

The outer cylindrical wall 1 of the drum is preferably of sheet metal; the liner wall 2 is of thin wood, metal, Celluloid, or cardboard—preferably the last. The drum diaphragms may be of any drum diaphragm material in the prior art. But toy drum diaphragms have been made of paper material reenforced with open woven fabric mesh in the paper. This material will stretch enough for my purpose and is what I use in practice.

To make the drum, I shape the two diaphragms 3 and 4 in dies to pie-plate form, in which the bottoms are perfectly flat and the skirts 5 and 6 are pleated somewhat like the sides of paper cups. I form the liner 2 of rather stiff cardboard, into a cylinder with overlapping ends and to the exact size that the liner is to have in the finished drum. The overlapping ends are fastened by sewing, pasting, or otherwise, to hold this size. I place diaphragm 4 upside down on a flat surface of support 7. This support is, for convenience, recessed, as shown in Fig. 2, so that the margin of diaphragm 4 overhangs an annular recess 8 in support 7. I place cylindrical liner 2 so as to rest on the outer flat margin of the diaphragm 4 with skirt 5 extending upwardly and outwardly about as shown. I place diaphragm 3 upside down on the top of liner 2 in corresponding position, as shown. I place a weight 9 on top of the diaphragm 3. This weight, temporarily kept in place, is made sufficient to hold the parts for an assembly step to be described. I place the sheet metal wall material 1, preferably shaped with its edges first slightly curved inwardly as seen in Fig. 2, in surrounding relation to the previous assembly. The recess 8 of the support is dimensioned so that when the wall material is placed in supported position about as shown, the parts will be centrally assembled and in balanced relation.

With the parts as shown in Fig. 2, I apply a hand squeezer or wrapper tool 9', seen in plan in Fig. 4 and in section in Figs. 2 and 3. This tool (or its equivalent) is used to wrap the wall 1 around the liner 2 from the position of the parts in Fig. 2 to the position of Fig. 3 and hold them in the latter position until the press parts of Fig. 3 perform the final assembly operation by crimping the parts into permanent holding position. The tool 9' operates on a pivot 10 with handles 11, somewhat like a lemon squeezer. The stop 12 is provided to limit the degree of pressure.

The tool 9' is placed so as to embrace the loose wall 1, as in Fig. 2. Then by bringing the handles together as tightly as stop 12 will permit, the wall 1 is tightly wrapped around the assembly held by weight 9 on support 7. As the wall 1 goes into final wrapped position, its ends overlap and the inner surface of wall 1 engages the skirts 5 and 6 of the diaphragms, wiping them into tight engagement with the margins of liner wall 2, the pleats in the skirts 5 and 6 assisting in the desired movement.

When the parts are thus assembled by tool 9', the temporary holding weight 9 is removed. The whole tightly held assembly is then taken by the holding handles 11 of tool 9' from the support 7 in Fig. 2 to the crimping press, indicated in Fig. 3. It will be readily understood that in this press the work is held by tool 9' while platen 14 presses it down on anvil 13 with crimping dies in the press parts to roll the beads 15 and 16 to simultaneously fasten both diaphragms 3 and 4 permanently to the drum walls and liner and preferably so as to tighten the diaphragm in the final step. The final locking joint for the assembly is of the same character as the joint of my prior patent. But it will be seen by comparison with that patent that in this improvement the whole drum is completed by assembling all the parts and forming the top and bottom diaphragms into the drum walls at one operation. While I have had a lot of experience in drum making and in using the plan of my

prior patent, it required much study and experimenting to discover a practical way to apply both drum heads simultaneously to the opposite ends of a single side wall support, as I now disclose.

In the use of my improved method the snares may be inserted, if desired, as in my previous patent.

While I have referred to the product of my method as a toy drum, it will be clear to those in the toy trade that the method is equally applicable to any of the various drum-like noise instruments, called for example tom-toms, banjos (with one diaphragm used as a sounding board, rattles, and various other names.

Previous to the conception of the present invention, so far as I am aware, toy drums were not made with the desired parts assembled and joined together as I have herein disclosed, but on the contrary it was thought necessary to proceed by more devious methods.

Having disclosed my invention, I claim:

1. The method of making a toy drum which consists in forming a cylinder to predetermined drum diameter from stiff but yieldable material such as cardboard and celluloid sheets, forming two disk-shaped members from drum head material, placing said members on the ends of the cylinder, wrapping the cylinder with a sheet of drum body material such as sheet metal and overlapping said sheet on the cylinder, and, while holding the wrapped sheet tightly on the cylinder and with the cylinder empty, rolling down the edges of said sheet at each end to permanently pinch the periphery of both drum heads, the lining material and the wrapping material into a permanent drum structure, the material of said drum heads being tensioned in said last-named step.

2. The method of making a toy drum which consists in forming each drum head out of sheet material with an integral narrow flange flaring outwardly around its periphery, forming a liner cylinder to the exact diameter of the drum, closing the ends of said cylinder by placing the drum heads thereon and with the cylinder empty, supporting this assembly in position to wrap sheet metal around it for the drum body, placing a weight on the top drum head to hold the assembly in position for the wrapping operations, and then tightly wrapping said assembly with sheet metal so that the ends of the metal overlap, holding the assembly thus wrapped and simultaneously rolling the edges of the sheet metal in a die press so as to bring said edges into a circular seam at the periphery of the drum heads with a pinching, tightening grip on the periphery of each drum head whereby the material of said drum heads is tensioned for the drumming function.

3. The method of making a toy drum which consists in forming two disk-shaped members by pressing them out of drum head material, forming a liner cylinder of cardboard having the exact interior diameter of the drum, placing one drum head disk-shaped member right side up on a support, placing the lining cylinder on top of that drum head, placing the other drum head member upside down on top of the cylinder to close said cylinder while empty, placing a single cylindrical sheet of metal with its lower edge on a support slightly below the lower drum head and with its ends overlapping and in condition to slide together to decrease the diameter of the cylinder of sheet metal, said sheet extending above the upper drum head so as to center the assembly, placing a temporary weight on the upper drum head enough to hold the assembly except for the said cylindrical sheet of metal, then applying a forming tool against said cylindrical sheet of metal to wrap it around the assembly of said drum heads and liner so as to clamp the drum heads and liner within said cylindrical sheet of metal, and finally while so clamped pressing the upper and lower edges of the said cylindrical sheet of metal into a rolled seam to permanently fasten the drum parts together and in said last step tensioning the drum head material on each end of the drum for the drumming function.

RALPH H. HIERS.