

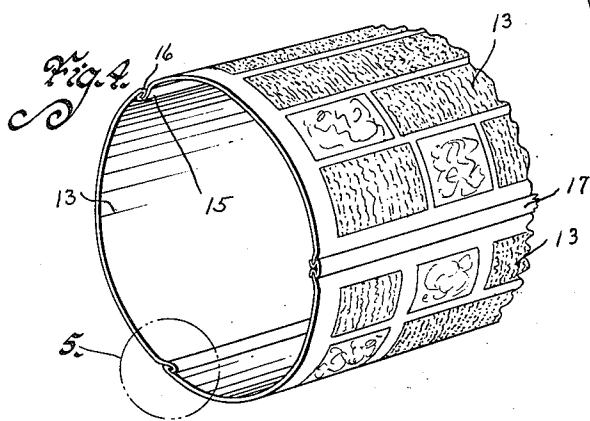
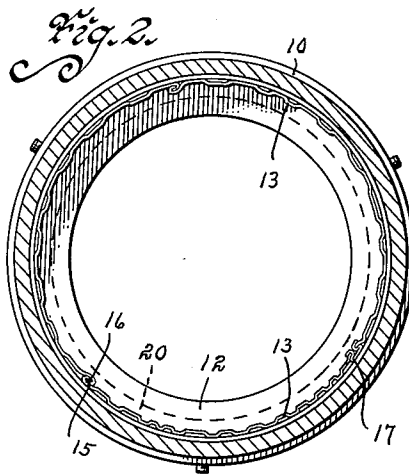
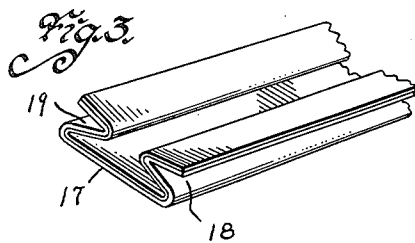
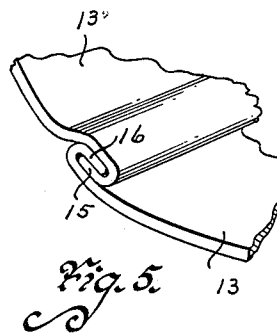
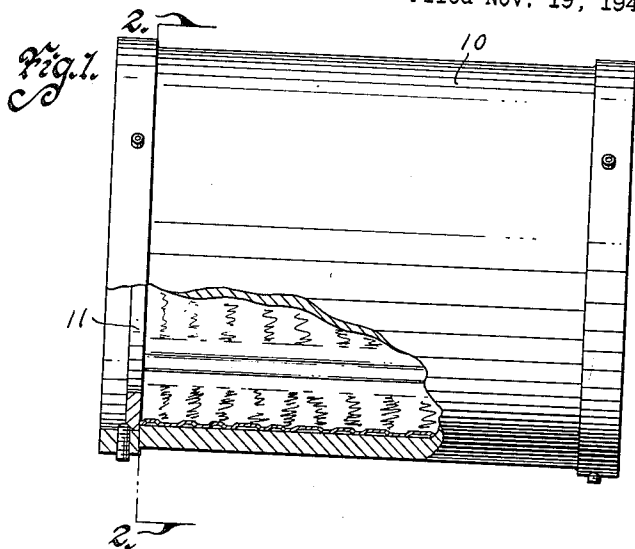
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METHOD FOR MAKING ARCUATE PRINTING PLATES

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METHOD FOR MAKING ARCUATE PRINTING PLATES

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1 Claim. (Cl. 29—505)

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This invention relates to arcuate printing plates and more specifically to the method of securing a plurality of shells together to form a hollow cylinder prior to the placement of a suitable backing material thereon.

The making of arcuate printing plates from previously formed arcuate shells is a relatively new process in the art, and upon which I now have several applications filed in the United States Patent Office.

The old method was to take a soft metal printing plate and then hammering and bending it into an arcuate plate. Obviously, this is slow and tedious work and the distortion of the printing plate is inevitable. Furthermore, the tops of the projections is the printing surface and that when the plate is bent into a curved printing plate, the tops of the projections will be spread further apart from each other. This objectionable spreading and further distorting of the printing surface points is caused by the stretching of the printing face surface and the contracting of the back of the plate, necessary in the bending of the plate into an arc. While the use of very soft metal aids in the easy bending of the plate, it really promotes certain distortions and "highs" and "lows" are most common. While rotary high speed printing presses have been accepted by all major printers as the ideal method of quantity printing, their main problem has been the obtaining of precision curved printing plates. Usually such printers depend upon commercial plate makers (electrotypers) for their plate supply. As above noted, however, accurate curved printing plates, under present methods of production are almost impossible, due to the stretching and distorting of the printing face and the damaging and distorting of the plate proper when it is bent into a curved plate from a flat plate. This objectionable distortion is even more serious and accentuated in making color plates register and especially is this true when the plates to be made had colored illustrations in combination with type, rules, or like. Obviously, the skeletonized or open portions of the plates do not stretch uniformly with the flat halftone or solid portions. Even in the making of partially accurate plates, the following equipment is used: a bending machine, a special solidifying machine, a special plate shaving machine, a special curved plate proof press, male and female saddles, and special curved finishing tools for plate correction. Besides this, is the time, labor and material costs.

My first experiments in attempting to solve

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such difficulties were to curve the mold, electroplate a printing shell thereon, remove the shell, and then back the shell with a backing material by centrifugal force. While the first phase was highly successful, considerable problems were experienced in the centrifugal casting of the arcuate printing plate.

One chief problem was the securing of a plurality of the shells together to form a hollow cylinder to place in the centrifugal casting machine. Not only must the shells be fastened together to form the continuous sleeve, but the joints must be sufficiently tight to prevent possibility of the hot molten backing material passing to the printing face, or between the face of the shells and the bore of the centrifugal drum. In my application, Serial No. 74,848 filed on February 5, 1949, on a method of and means for making arcuate printing plates, I teach a metal link strip for securing all the shells together. This strip is shown in Fig. 3. The objections to the use of such strips between each of several shells, however, are the costs involved and difficulty of assembly. Also as I cast in the form of a hollow cylinder, and then the cast is cut into the desired arcular segments, these strip links have a tendency to interfere with the cutting which is done by a power saw. Therefore, the chief object of this invention is to provide a method of joining at least most of the shells together without the employment of an auxiliary attaching link.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which:

Fig. 1 is a side view of a centrifugal casting drum showing my sleeve shell therein. Such drums are rotated and solidifiable material introduced therein to form a backing support to and on the printing shell.

Fig. 2 is a cross-sectional view of the drum taken on line 2—2 of Fig. 1.

Fig. 3 is an enlarged perspective view of a link slip that may be employed when desired.

Fig. 4 is a perspective view of a tubular printing plate produced by my method.

Fig. 5 is a perspective view of two shells joined together and which is the subject matter of this invention.

Referring to the drawings I use the numeral 10

3 to designate the centrifugal casting drum having a smooth center bore and two detachable ring washer discs 11 and 12 in its two end portions respectively. These two members 11 and 12 are removable for the inserting of my shell sleeve and also for removing the resultant cast. The specific structure of my casting machine is not, however, important to this present invention and my method of joining the shells may be used in even other types of casting machines.

The arcuate shell or matrix 13 is designed to rest adjacent the inside of the bore, as shown in Fig. 1 and Fig. 2. Such shells, however, are arcular and are not of sufficient size for one of them to completely extend around the inside bore of the drum. As indicated, however, it is essential that the resultant casting be that of a complete cylinder in order to overcome certain technical problems. In order that this may be accomplished, I join together a plurality of printing shells to make a perfect close-fitting sleeve inside the drum, as shown in Fig. 2. The method of joining the printing shells together is most important. Not only must the shells be fastened together to form the continuous sleeve, but the joining must be sufficiently tight to prevent possibility of the hot molten backing material passing to the printing face or back of the shells adjacent the bore of the drum. This tendency of the hot backing metal or material to pass through the smallest openings is particularly present in centrifugal casting.

Therefore, I take the various shells that are to make up the cylinder sleeve and bend two of their opposite side edge portions back upon themselves, as shown in Fig. 5. One-half of these bends should extend to the back and one-half to the front so that the bent portion of one shell will form a hook portion 15 to complement and engage the hook portion 16 of the shell adjacent to it. By thus joining all the shells, a desirable tube is obtained. The interlocking marginal edge portions of the shells may be tightened by pressing or like if desired to more rigidly form the sleeve cylinder before placement in the casting machine. If the shells are of the right dimensions, the proper sleeve for a given casting machine will result. If not, a "blank" shell may be necessary to enlarge the sleeve. In some cases it may be desirable to connect the length of fastened together shells with a link, as shown in Fig. 3, instead of using the interlocking bent edges of the shells throughout the circle. In the drawings I show one of these links used and in general designated by the numeral 17. This strip has its two side edge portions, each bent inwardly and then outwardly to provide the two receiving grooves 18 and 19. To fasten the marginal edge portions of two shells together, the two adjacent marginal edges of the two shells are inserted in the grooves 18 and 19, respectively, and then the grooves are mechanically closed by clinching or compressing the side edges of the strip link.

After the sleeve shell is completed (with or without one of the links 17) it is placed inside the casting drum and a backing 20 formed thereon in the usual way. By being cast in a cylinder as herein disclosed there are no ends to curl or warp. When the individual arcuate printing plates are cut out of the cylinder cast they will be of perfect and even curvature throughout their lengths.

From the foregoing it will be appreciated that the curved printing plate produced by my method

is substantially ready for use as soon as it is cut from the cylinder cast.

In preparing the shell sleeves for insertion in a given drum, it is desirable that the strip 17 not be too tightly anchored to the shells. The reason for this is that a slight expansion of the sleeve is necessary so that it will "fill out" against the wall of the bore 11 of the drum. The link strip shown does permit the shells to slightly move away from each other during the expansion of the sleeve caused first by the rings 22 and secondly by the centrifugal force of the molten backing metal. While I have shown the clinching marginal edges of the strip 17 to the inside of the shell sleeve, they may be reversed to extend to the outside, if desired. As the printing plate does not have to be hammered or bent after casting, the backing material used may be harder than that used heretofore in making printing plates. Printing plates made by my method are not only more accurate but are more durable in use.

While I have described the hook bending or hook flange of shells, for attachment to each other, it is obvious that any type of sheet or shell having relief indicia thereon may be so fastened together for casting purposes.

Some changes may be made in the construction and arrangement of my method of and means for making arcuate printing plates without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claim, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

The method of securing relief indicia printing shells together to form a cylinder for receiving centrifugally applied molten backing material to the inside of the cylinder so formed, said method of attaching comprising the bending of one of the marginal edge portions of one of said sheets back upon itself to form a hook flange, the bending of one of the marginal edge portions of the other said sheet back upon itself to form a hook flange; one of said hook flanges extending to the rear of the face of the sheet of which it is a part and said other hook flange extending over the face of the sheet of which it is a part, and the interlocking of the two hook flanges for holding the said two sheet members from moving away from each other during the casting process, and for sealing the two marginal edge portions of any two so attached sheets against leakage of the molten backing material until the backing material has solidified.

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