

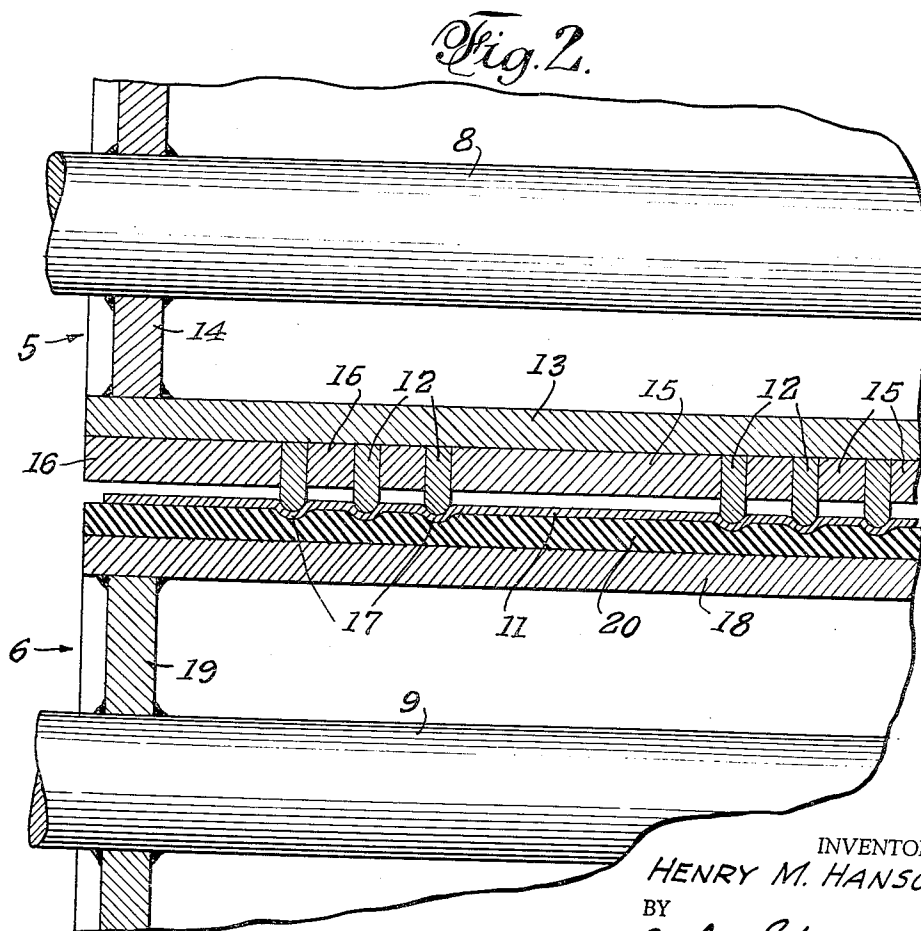
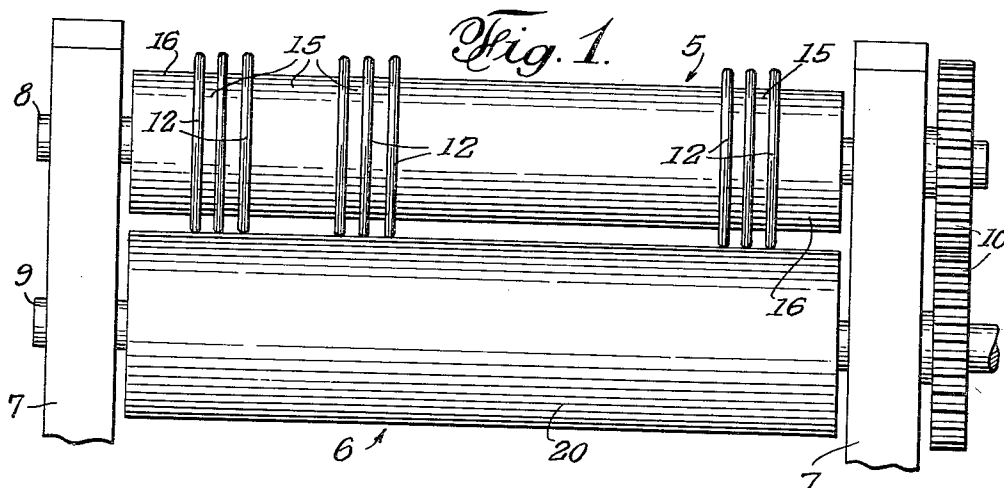
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EMBOSSING ROLLS

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EMBOSSING ROLLS

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This invention relates to a set of rolls for embossing or forming sheet or strip stock, particularly sheet metal.

An object of the invention is to provide sheet forming or embossing rolls that may emboss plain sheet stock or may emboss sheet stock already provided with an embossed pattern, in the latter case, without affecting or effacing such embossed pattern. Thus, any design or pattern on the sheet stock being passed through the rolls is left undefaced and undisturbed except for the embossing performed by the rolls.

Another object of the invention is to provide embossing rolls of the character referred to that draw the metal being embossed along only the areas of embossment, thereby producing an embossed sheet that has substantially the original width but is stable and highly resistant to buckling across the formed or embossed pattern.

The invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawing merely shows and the following description merely describes one embodiment of the present invention, which is given by way of illustration or example only.

In the drawing, like reference characters designate similar parts in the several views.

FIG. 1 is a side elevational view of a pair of embossing rolls according to the present invention.

FIG. 2 is an enlarged, broken longitudinal sectional view of a portion of the rolls shown in FIG. 1.

The present embossing rolls comprise a forming roll 5 and a mating roll 6. In a conventional manner, said rollers are mounted in bearings 7 to rotate on their respective axes 8 and 9 in opposite directions. Connecting gears 10 provide such opposite rotation. It will be clear that the rolls 5 and 6 will feed a sheet 11 between them and the rolls will form such sheets according to the characteristics of the forming roll 5.

According to the present invention, the roll 5 is provided with a plurality of forming rings or flanges 12 that are coaxially mounted on a core or body 13 that is fixedly connected to the shaft 8 by end webs 14. The rings are held in desired spaced relation by spacer collars 15 that vary in length according to the desired spacing of the rings 12. End collars 16 lock the assembly of rings 12 and collars 15 and said collars 16 are suitably affixed to the body 13 to achieve such locking of the assembly.

It is the outer periphery of the rings 12 that do the forming. Hence, the same may have a transverse shape or be provided with surface markings or knurling, as desired. In this case, the ring peripheries have a half-round form that would form half-round grooves 17 to a sheet 11 as the same is drawn between the rolls. It will be clear that the difference of outer diameter between rings 12 and collars 15 and 16 is such that, during forming, the sheet 11 is spaced from the spacers 15. Therefore, any design or pattern that may be initially provided on the sheet is unaffected by the forming operation except by the addition of the grooves 17.

The roll 6 comprises a cylindrical body 18 affixed to the

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shaft 9 by end webs 19, and a rubber liner 20 on said body. The term rubber is here used to designate compressible material whether made of natural or synthetic rubber or of other materials, for instance, synthetic resin having similar compressible properties.

The rolls 5 and 6 may be set relatively so that the rings 12 have their peripheries tangent to the outer face of liner 20. However, this setting may be varied according to the depth of forming desired and according to the thickness of the sheet 11. Hence, the rings may bite into the liner or may be spaced therefrom. In any case, the spacing is such that the thickness of sheet 11 is greater than such spacing, causing the rings to form grooves in said sheet.

It will be seen that, as the grooves 17 are formed, the same displace grooves in the liner 20. Considerable friction between the sheet grooves 17 and the grooves or indentations in the liner is created, thereby insuring transverse stability of the original sheet width. The portions of the sheet between grooves 17 are unaffected by the stretch caused by the rings 12. As a consequence, a sheet formed by the present rolls is resistant to buckling and, as above explained, retains on its surface any design or pattern initially formed thereon. The mentioned stability of transverse size results from eliminating deforming forces or stresses on the sheet between grooves 17. Such stretch as occurs is present only where the rings 12 form the sheet to provide the grooves 17.

As can be seen from FIG. 2, the outer diameter of the rings 12 is greater than the outer diameter of spacers 15, the difference being more than half the thickness of a sheet 11 being embossed. Hence, during embossment, any previous embossment in the sheet cannot be obliterated because the same is spaced from the spacers 15 and is in contact only with the compressible liner 20.

While the foregoing specification illustrates and describes what I now contemplate to be the best mode of carrying out my invention, the construction is, of course, subject to modification without departing from the spirit and scope of my invention. Therefore, I do not desire to restrict the invention to the particular form of construction illustrated and described, but desire to cover all modifications that may fall within the scope of the appended claims.

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

1. Embossing rolls for embossing sheet material comprising a forming roll provided with coaxial forming rings larger in outer diameter than the diameter of the roll, half said diametral difference being substantially greater than the thickness of a sheet being embossed, and a mating roll provided with a compressible outer liner that is compressed by grooves formed by the outer peripheries of the forming rings in a sheet passed between the rolls.

2. Embossing rolls comprising two mating rolls having their outer surfaces spaced apart a distance substantially greater than the thickness of a sheet passed therebetween, one roll having a compressible face, and the other roll being provided with coaxially forming rings approximately tangent to said face and adapted to form grooves in said sheet by forcing the same in a direction to compress said surface.

3. Embossing rolls comprising two rolls, each having a cylindrical body and mounted to rotate oppositely, the outer faces of said rolls being spaced apart a distance greater than the thickness of a sheet passing between the rolls during rotation thereof, one roll surface being compressible, and the other being provided with at least one coaxial embossing ring to form a groove in the sheet and thereby compress the compressible surface therebeneath.

4. In embossing rolls, a forming roll comprising a cylindrical body, a set of forming rings coaxially strung on said body, and spacer collars separating said rings, a mating

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roll comprising a cylindrical body provided with a compressible outer liner, the rolls being so spaced that the liner and the outer faces of the collars are spaced a distance greater than the thickness of a sheet being embossed by the rollers.

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