

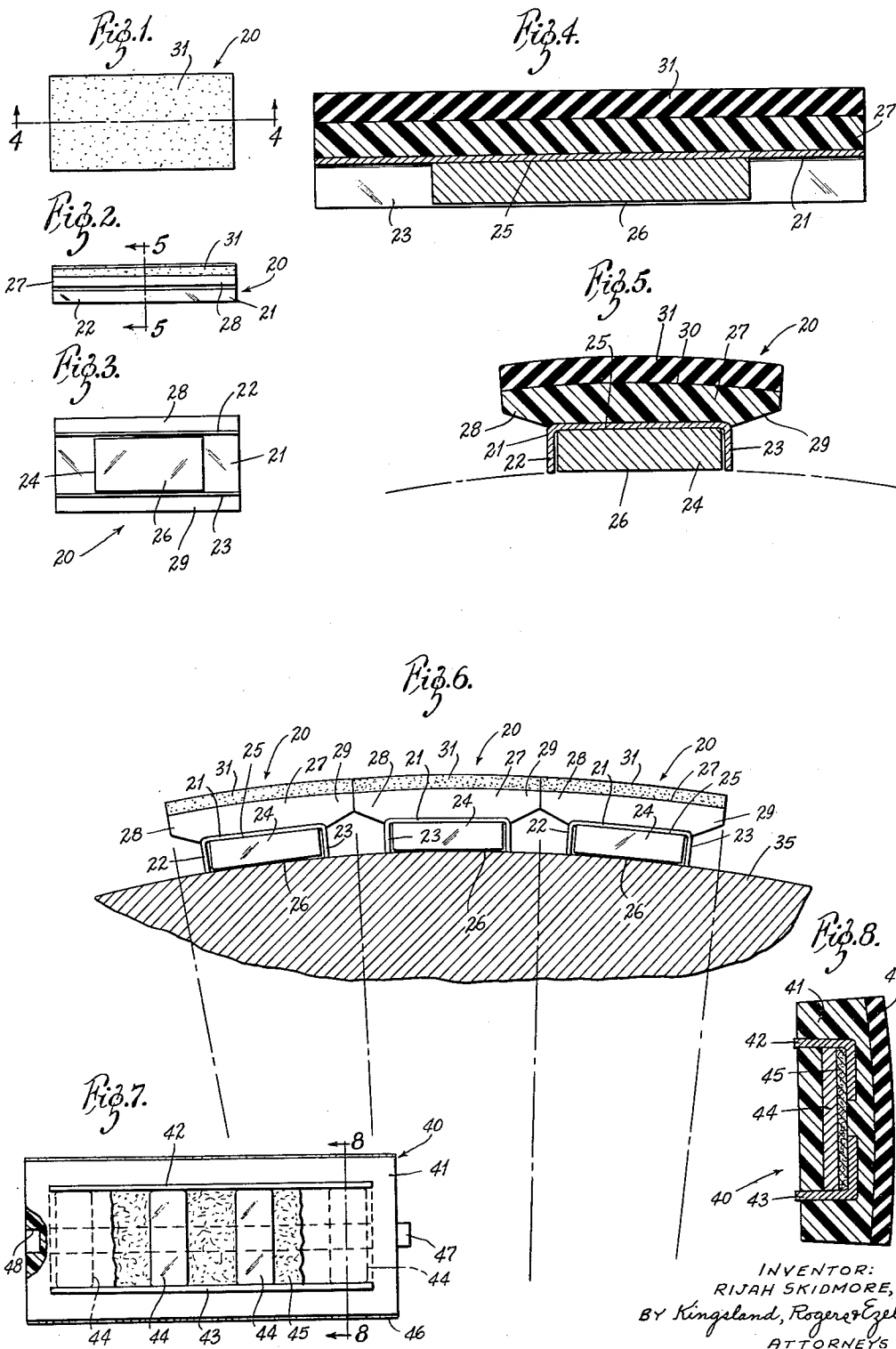
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TYMPAN

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1

3,064,330
TYMPAN

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This invention relates to an attachment for a laminating machine. It is adapted for many uses, such as with a laminating machine of the type employing a large drum opposed by a pressure roller, between which the sheets of material to be laminated together are compressed. The specific attachment involved here comprises a section to be added to the main drum for spacing the material from that drum. The resulting raised surface is known in the trade as a tympan. The main purpose of this attachment is to prevent the main drum, usually in the form of a cylinder, from becoming coated with glue. The invention more particularly relates to such an attachment means which is comprised of a plurality of separable units.

While many uses for the invention will occur to those skilled in the art, and the invention is not intended to be limited to use with a laminating machine, it is described in that environment for illustration.

A typical example of the type of laminating machine with which the present invention is devised for use is the type designed for gluing a sheet of paper to a sheet of cardboard. Such a machine might be used to complete the construction of an advertising board, for example, wherein the advertising design has been effected upon the paper and it is desired to make that paper more rigid by the addition of a cardboard backing. Such a laminating machine, while complicated, incorporates at least a large main cylinder against which one of the sheets to be laminated is placed. After this sheet has been coated with glue and before the main cylinder has rotated far enough to approach a rubber-covered pressure roller, the second sheet is placed with a leading edge adjacent the leading edge of the first sheet. Thereafter, the two are squeezed between the main cylinder and the pressure roller and an even laminating operation is performed.

In these laminating machines, a roller, partially submerged in a tub of glue, is often used to apply the glue. Even when other glue applicators are used, they, like the glue roller, are continually covered with glue. If no raised surface were used beneath the paper sheets, the entire drum surface would be coated as it passed the glue applicator so that succeeding sheets placed on the drum would be stuck there by glue. An additional reason for the raised surface, or tympan, is that during the pressing or squeezing operation, occasionally an amount of glue is squirted out from between the sheets of material and deposited upon the main cylinder. Subsequently, when a new operation is to be performed and one of the sheets is placed against the cylinder, the glue spattered thereon by the preceding operation interferes with the removal of a subsequent one.

Tympans have been developed heretofore for elevating or spacing the sheets from the main cylinder. As these spacing means are all slightly smaller in surface area than the sheets to be laminated (there may be between $\frac{1}{32}$ and $\frac{1}{8}$ inch overhang), no glue will be spread upon the tympan. Likewise, since the glue applicator is spaced

2

from the main drum, glue will not be applied to it, either. The glue which squirts out from between the sheets will fall not on the spacing means but onto the main cylinder since the laminated sheets cover substantially the entire surface of the spacing means. Then, when subsequent sheets are placed upon the spacing means, they are not stuck to that spacing means by the extra glue.

The size of the spacing means, or more particularly the area of the raised surface of the spacing means, must be varied according to the size and area of the material to be laminated. For the spacing means heretofore employed, the only way of varying the area of the surface has been to replace that spacing means with a different one. It is an important object of the present invention to provide a raised-surface spacing means for use upon a laminating machine, which spacing means is comprised of a plurality of tympan units to which may be added or subtracted additional units for varying the effective surface of the spacing means (or tympan).

Although in a general sense, spacing means have been used before for the same purpose as that to which the present invention is directed, these prior spacing means have comprised one or more layers of cloth, paperboard, etc., which have been discarded after one or two usages. This cloth or paperboard tympan must be held in place by either a mechanical device at the ends or by glue. The disadvantages of gluing anything to the main cylinder are obvious, and it is another object of the present invention to provide a tympan which is held to the main cylinder by quickly releasable means, specifically by magnetic means.

Still another object of the invention is to provide a tympan which has a hard, yet somewhat resilient, surface for long life. The surface of the present tympan comprises a durable resilient material such as neoprene or rubber construction.

Another object of the invention is to provide a plurality of tympan units which include magnetic holding means for attachment to a main cylinder of a laminating machine, which may be added to or removed according to the size of the material to be laminated.

Another object of the invention is to provide a tympan comprised of a plurality of units, each unit including means for aligning it with respect to the others.

Still another object is to provide a tympan comprised of a plurality of units of a minimum number of different sizes, which units may be combined in various combinations to form any of a wide range of possible tympan sizes. A corollary object is to provide tympan units in various sizes in which these sizes have been so computed that a low inventory maintained by a supplier will, nevertheless, permit a complete inventory.

Other objects and advantages will be apparent to those skilled in the art.

In the drawings:

FIGURE 1 is a plan view of a tympan unit;

FIGURE 2 is a side elevation taken lengthwise of the unit of FIGURE 1;

FIGURE 3 is a bottom view of the tympan unit;

FIGURE 4 is a view in section taken along the lines 4—4 of FIGURE 1;

FIGURE 5 is a view in section taken along the lines 5—5 of FIGURE 2;

FIGURE 6 is a view showing a plurality of tympan

units arranged on the surface of a cylinder, with the cylinder shown somewhat schematically and in section;

FIGURE 7 is a bottom view, partially broken away, of a modification of the invention; and

FIGURE 8 is a view in section taken along the lines 8-8 of FIGURE 7.

Referring now to the drawings, each tympan unit is designated generally by the numeral 20. There is a channel member 21 extending the length of the tympan unit, but it is not as wide as that unit. The channel has legs or flanges 22 and 23 adapted to extend toward the cylinder to which the tympan unit is to be attached. The channel member 21 is constructed of a material which is magnetically conductive, such as iron or steel.

Placed between the legs or flanges 22 and 23 of the channel member 21, is a magnet 24. The magnet 24 need not be as long as the channel member 21, although it may be. The magnet 24 may be thought of as having a top surface 25 and a bottom surface 26, and the distance between the two should be less than the height of the flanges 22 and 23. The reason for this preference is that since the tympan units are to be attached to a cylindrical surface, it is best that there be a clearance between the magnet 24 and the cylinder so that the flanges 22 and 23 will make contact with that cylinder. Otherwise, the clearance or difference between the thickness of the magnet 24 and the flanges 22 and 23 should be such that the clearance between the magnet and the cylinder is a minimum. The magnet 24 may be attached to the channel 21 by glue or other well known means, although if no attaching means is provided, the magnet will remain within the channel 21 due to its own attraction toward that channel.

There is a plastic body section 27 cast directly on or otherwise secured to the top of the channel member 21. The body member 27 is at least as long as the channel member 25 and, in addition, it is somewhat wider. Thus, there is an overhang 28, and another one 29, beyond each flange 22 and 23 of the channel member 21.

Finally, the body member 27 has secured to its top surface 30 a resilient face 31. The face 31 has the same length and width dimensions as the top 30 of the body member 27. It can be observed from FIGURE 5 that both the top surface 30 of the body member 27 and the face 31 are parallel and that the face 31 is gently arcuate to form what might be called the working surface of the main cylinder of a laminating machine. Thus, there will be uniform pressure applied to the face 31 as it rolls past a pressure roll.

The tympan units 20 may be used in any combination. For example, FIGURE 6 illustrates an end view of three rows of tympan units magnetically secured to a cylinder 35. Since the body member 27 with its face plate 31 overlaps the channel member 21, the face plates 31 of the several tympan units 20 can abut one another without interference from the channel 21 and its magnet 24.

The tympan units 20 will cling to the metal cylinder because of the magnet 24. Since the magnet 24 is attached directly to the magnetically-conductive channel member 25, its magnetic field will be induced in the flanges 22 and 23. It is the flanges 22 and 23 which make physical contact with the cylinder 35.

Any of the tympan units 20 can be removed from the cylinder and later replaced by others, according to the size of the sheets to be laminated by the machine.

Obviously, as can be appreciated from FIGURE 6, if a sheet of paper is placed upon the tympan comprising the combination of tympan units 20, and the drum 35 is rotated past a glue roller, glue will be applied to the paper surface. However, the glue will not contact the drum surface because of the spacing feature of the tympan. Also, if some glue is squeezed out during a laminating operation, that glue will fall onto the drum 35 rather than on the tympan sections 20. This, of course, providing the proper number and arrangement of tympan units has been employed to assure the slight overlap of

paper beyond the surface area of the tympan as has already been explained. Thus, when that laminating material is removed and another laminating process is to be performed, there will be no glue upon the raised surface defined by the tympan sections 20.

A modification of the invention is shown in FIGURES 7 and 8. The main difference between the tympan units shown in these figures, from those already described, is that they comprise a plurality of bar magnets imbedded in a plastic material. Thus, in FIGURES 7 and 8, there is shown a tympan unit 40 having a plastic block 41. Molded into the plastic block 41 are a pair of angle members 42 and 43, a plurality of bar magnets 44 and a sheet of fibre insulation 45. As was true with the tympan unit 20, the unit 40 has a resilient face plate or block 46 attached to the plastic 41.

The embodiment of FIGURES 7 and 8 includes a means for aligning the tympan units in even rows. This means comprises a plug 47 at one end of the unit 40 and a socket 48 at the other end. Therefore, when a plurality of tympan units 40 are to be placed together on a cylinder, the position of each relative to the others will be dictated by the positions of the plugs and sockets 47 and 48.

Because the plug and socket arrangement helps maintain alignment of the several tympan units, the plugs and sockets could be included with the embodiment of FIGURES 1 through 6.

Although the specific size of the tympan units may be varied from the following dimensions, those dimensions are included here because they represent six tympan unit sizes which will permit the assembling of any desired tympan size ranging from 11" by 14" to 48" by 72" (the upper limit being imposed by the maximum capacity of a standard laminating machine). The unit sizes which have been found to make possible this versatile variation are $1\frac{1}{8}" \times 2\frac{1}{2}"$, $1\frac{1}{8}" \times 2\frac{3}{4}"$, $1\frac{1}{8}" \times 3\frac{1}{4}"$, $1\frac{1}{8}" \times 2\frac{1}{2}"$, $1\frac{1}{8}" \times 2\frac{3}{4}"$ and $1\frac{1}{8}" \times 3\frac{1}{4}"$. These six sizes can be quickly combined end to end and in rows in the required number to provide a completed tympan of a desired size. Because only six basic sizes are involved, an extremely low inventory of parts is possible.

What is claimed is:

1. In a machine for laminating together a pair of material sheets wherein the machine has a drum for supporting a means defining a raised surface, the means defining the raised surface comprising: a plurality of separate units, each having a face defining a portion of a cylinder with the side edges of the face defining a rectangle, and magnetic means for releasably attaching a plurality of the units to the surface of the drum with the edges of adjacent units abutting one another to define an overall, continuous raised surface of variable size and shape according to the number and relative positions of the units, the magnetic means comprising a pair of spaced magnetic flanges connected to each unit and extending from each unit in a direction away from the face of the unit parallel to the axis of the drum, the flanges being of magnetic material, and magnetic means between and in magnetic communication with the flanges for inducing magnetism in the flanges.

2. The combination of claim 1 wherein the portion of each unit defining its face is resilient.

3. A combination of tympan units for application to the metallic surface of a cylindrical drum to provide a raised surface beyond the surface of the drum, each tympan unit comprising a body having a top, four sides and a bottom, the top being rectangular at its edges and the four sides extending downwardly from the edges of the rectangular top, the surface of the top between its edges being arcuate of a radius equal to the radius of the drum plus the total height of each tympan unit, a pair of magnetic metal plates extending downwardly from each tympan unit at least far enough that the lower edges of the metal plates project below the bottom of the body, the plates being spaced from one another and the lower edges of the plates being parallel to an element of the arcuate

5

top of the body, and a permanent magnet mounted between and in contact with each pair of plates, whereby individual ones of the tympan units can be attached to the surface of the drum in combination with various members of other tympan units to vary the size of the total tympan top surface.

4. The combination of claim 3 wherein there are articulate interlockable means between adjacent tympan units to lock the units together in rows.

5. The combination of claim 3 wherein at least the top 10

6

surface of the body of each tympan unit is defined by a resilient material.

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