May 4, 1954 T. S. O'KONSKI 2,677,323

PACKAGING EXPANDED METAL LATH FOR SHIPMENT

Filed Jan. 17, 1950

2 Sheets-Sheet 1

Fig. 1.

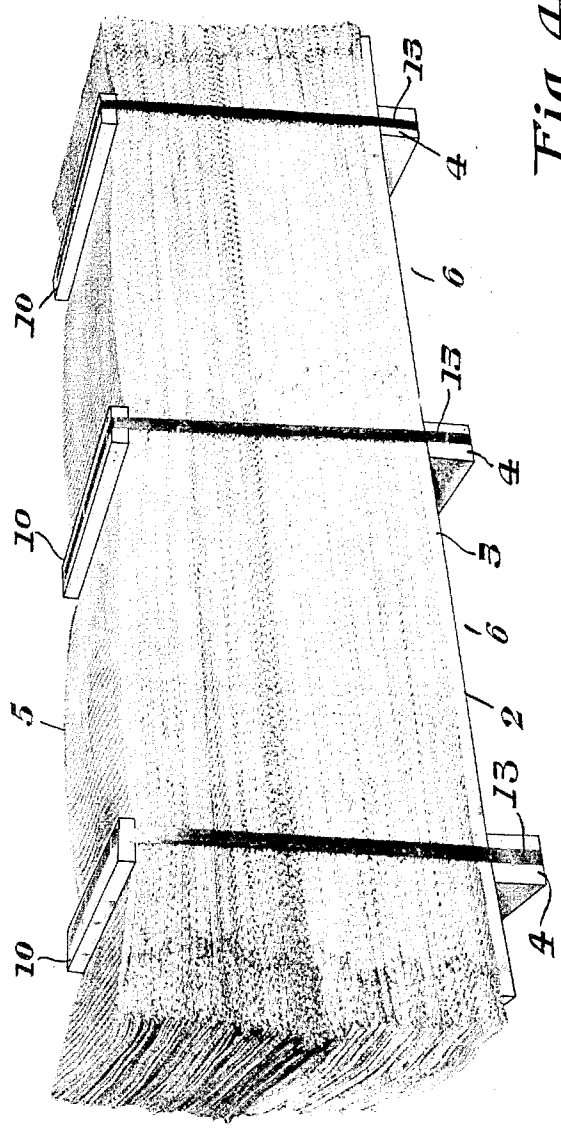

Fig. 4.

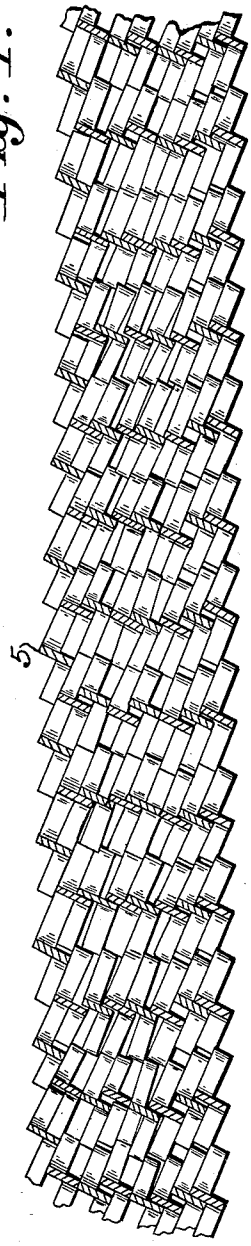

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Fig. 2.

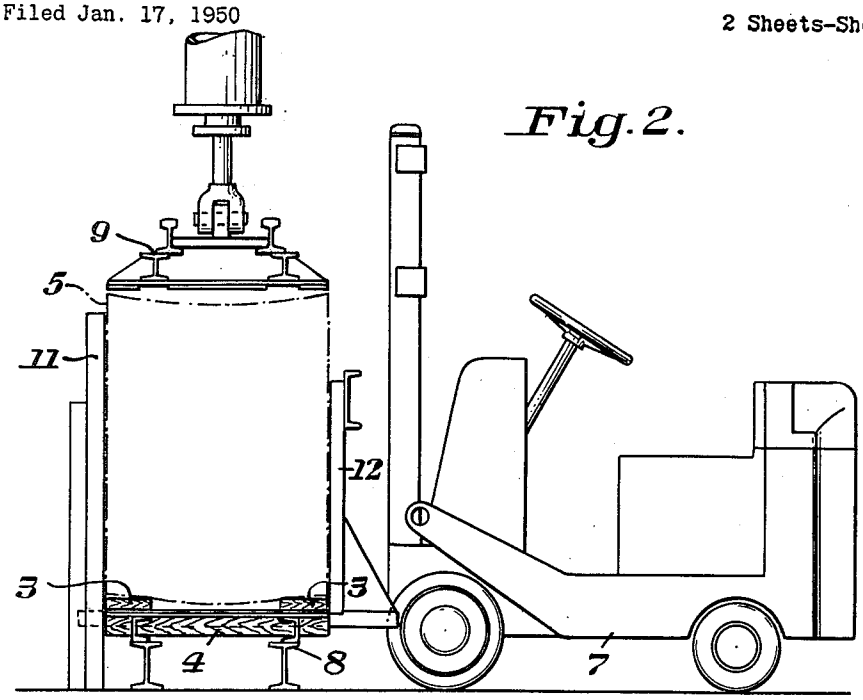
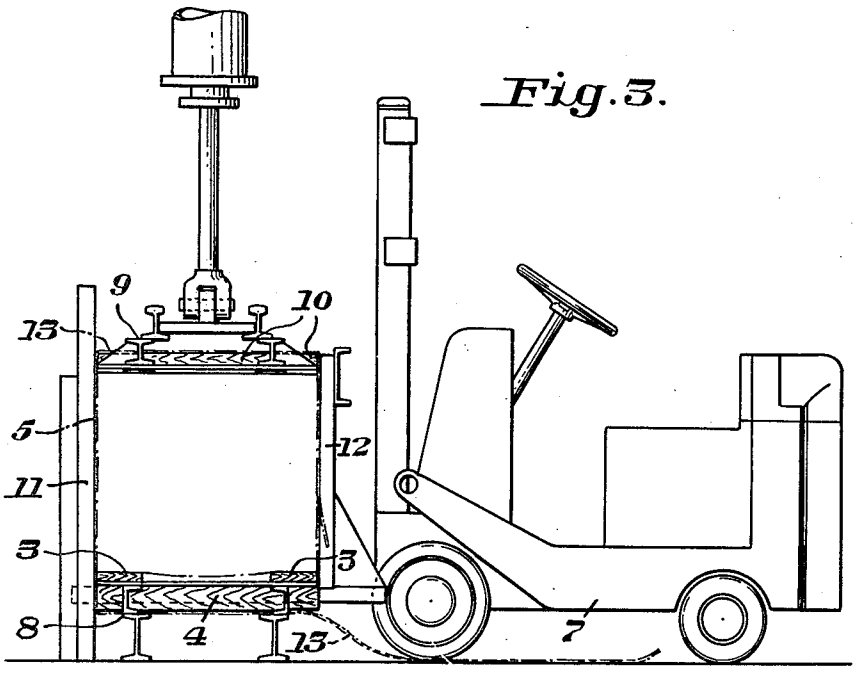


Fig. 3.



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PACKAGING EXPANDED METAL LATH FOR SHIPMENT

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2 Claims. (Cl. 100—3)

1

This invention relates to the packaging of expanded metal lath for shipment.

Prior to the present invention, expanded metal lath was packaged for shipment by piling several hundred sheets of expanded metal lath on a skid and banding the lath to the skid. The package thus formed was very unsatisfactory in respects which will be explained but no solution to the problem found prior to my solution herein disclosed.

Expanded metal lath is made by feeding a steel plate to a rotary slitter which forms in the plate rows of staggered slits, the slitted material as it advances being stretched to form a generally planar sheet of steel having generally diamond-shaped openings formed by thin ribbon-like strands and bonds which are disposed at various angles to the general plane of the sheet. The lath is subject to various factors rendering the sheets nonuniform; no two sheets after having been slit and expanded are identical. The stretching of the slitted sheets may be nonuniform from sheet to sheet due to slight differences in the gauge, quality or hardness of the steel. As a result, when two sheets of expanded metal lath are disposed atop one another they seldom if ever nest perfectly throughout. Two superposed sheets if laid carefully one upon the other may nest at portions of their areas but not at other portions. A third sheet added to the pile may nest with the second sheet at portions thereof different from the portions of the second sheet which nest with the first sheet. Moreover, unless the piling is done with greater care than is exercised in piling sheets of expanded metal lath for shipment in the factory the sheets will not be in exactly the right position to nest to the maximum extent provided for by their individual characteristics.

In actual practice a pile of sheets of expanded metal lath is very uneven in thickness or height, being either relatively thick at one end and relatively thin in the middle and at the other end or relatively thick at both ends and relatively thin in the middle. This is due to the fact that the stretching action is more uniform at the middle of a sheet than at the ends so that ordinarily loosely piled sheets of expanded metal lath nest to a somewhat greater extent at their middle portions than at their ends. Moreover, the concentration of weight at the middle of the pile adds further to the unevenness of the height of the pile. When such a pile is laid upon a skid and simply banded to the skid, as has been the practice prior to my invention, there is formed a

2

package which though flat on the bottom because of the provision of the skid is very uneven at the top. In banding the bands are pulled as tight as possible with a banding tool but that does not obviate the difficulty; on the contrary, it may accentuate the unevenness of the pile of sheets of expanded metal by causing the unsupported ends of the sheets to fan out and flare up.

It is difficult to stack packages such as those above described because of the unevenness of the tops thereof and there is great danger of upper packages of a stack falling off during shipment. Moreover, due to handling and the forces to which the packages are subjected in transit, as, for example, in railroad cars, the bands become loose, and the sheets shift relatively to one another and are frequently bent and otherwise damaged. When such packages of expanded metal lath are stacked one upon another in a railroad car for shipment the lower packages are compressed by the mass of the upper packages, permitting the bands of the lower packages to become loose and ineffective with the result that the stack will lean over sidewise and the upper packages may fall off. Still further, after the bands of a package have become loose and the package has become distorted the sheets do not resume their original stacked relationship but the package becomes rather a banded heap with sheet edges sticking out at various points. Such a banded heap cannot be efficiently handled and handling of it without damaging the projecting sheet edges is very difficult.

I have solved the problem by providing an improved shipping package of expanded metal lath which obviates the disadvantages of the prior packages. I have found that a package of predetermined, generally approximately right parallelepipedal, shape and which will permanently retain its shape and which has great advantages in handling, stacking and transit in railroad cars may be formed by compressing the pile or stack of sheets of expanded metal lath and banding the thus prepared pile. The pile of sheets of expanded metal lath should be compressed throughout at least the greater portion of the area of the pile parallel to the sheets. In the optimum practice of my invention the pile of sheets of expanded metal lath is compressed substantially throughout the area of the pile. Local compression brought about by simply drawing tight the fastening bands without compression throughout at least the greater portion of the area of the pile parallel to the sheets is insufficient to accomplish my result

no matter how tight the bands be drawn. The compression of the pile sheets throughout at least the greater portion of the area of the pile parallel to the sheets consolidates the pile and promotes nesting of the sheets. The pressure of the sheets against one another apparently causes slight springing of certain of the strands and bonds of certain sheets and forcing of those strands and bonds into mesh with those of adjacent sheets. The consolidation and nesting may be further promoted by agitating the pile of sheets during compression thereof and I prefer to agitate the pile during compression although I can obtain satisfactory results without doing so.

As explained above, when sheets of expanded metal lath are merely piled upon one another the resultant pile is very uneven. When that pile is compressed as I propose the portion thereof of greatest height is first engaged and reduced in height until gradually and progressively all the portions of the area of the pile are compressed. The compression is continued until even the portion of the pile which originally was of the least height is under compression. As the pressure increases it will tend to equalize throughout the pile to a certain extent. The pile assumes right parallelepipedal form with its upper surface substantially flat and parallel to its lower surface. It is impossible to accomplish such a result by banding only. The application of pressure throughout the entire area of the pile apparently, as suggested above, stresses the individual strands and bonds of the sheets sufficiently to bring about quite material intermeshing or nesting thereof which is not brought about by the drawing tight of spaced apart relatively narrow bands under even the greatest pressure. Indeed, the result of drawing spaced apart bands tight about a pile of sheets of expanded metal lath may be to accentuate the lack of uniformity in the height of the pile.

I compress the pile of sheets of expanded metal lath so greatly that in handling and shipment the impacts to which the package is subjected can never result in loosening of the bands or material change in the shape of the package. The packages, being of right parallelepipedal form, are easy to stack and remain stacked like boxes. The expanded metal lath is protected against damage by the tightness with which it is confined in the package. Difficulties of handling and damage to the sheets of expanded metal lath due to loosening of the bands are entirely obviated.

The number of sheets of expanded metal lath in a package may be varied as desired. A commercial package consists of fifty bundles of ten sheets each or a total of five hundred sheets. The sheets are initially wired together in bundles and the bundles thrown down upon one another in a pile upon a skid. The pile is compressed against the skid by compression means acting throughout at least the greater portion of the area of the pile parallel to the sheets until the pile has been compressed to the requisite extent, whereupon it is banded. Spreaders, which may be boards, may be and preferably are laid across the top of the pile prior to banding and the bands preferably pass about the pile of sheets, the spreaders and the skid.

Having in mind what is stated above, I provide an improved shipping package of expanded metal lath comprising hundreds of sheets of

expanded metal lath piled atop one another and compressed and banded together so that the pile of sheets of expanded metal lath is of generally right parallelepipedal form. The sheets are nested to an extent far greater than is possible by banding alone. The nesting may be promoted by agitating the pile while it is being compressed.

To fully accomplish my improved results the pile of sheets of expanded metal lath should be compressed in the manner which I have described until the volume of the pile has been reduced at least about 20%. This results in material increase in the density of the pile in relation to its density prior to being compressed. I have found that when the pile compressed throughout at least the greater portion of its area parallel to the sheets is reduced in volume 20% or more it has the advantages which I have outlined above while if the reduction in volume is materially less than 20% certain of the advantages may not be fully realized. For certain purposes a lesser reduction in volume may be sufficient but I prefer to compress the pile until its volume has been reduced at least 20%. In the optimum practice the volume of the pile is reduced about ⅓ or 33⅓%. A pile thus prepared embodies to the fullest extent all of the advantages enumerated above.

When I refer to the volume of the pile I mean the volume within the outer faces of the pile, not the volume displaced by the metal. The volume displaced by the metal remains substantially constant whether the material is piled loose or pressed tightly together. If the pile were parallelepipedal before being compressed the reduction in volume would be proportional to the reduction in height but as the pile is initially nonuniform in thickness or height and finally relatively uniform in height it will be apparent that reduction in height cannot be relied upon as an indication of the reduction in volume. The reduction in height is different at different portions of the piles. In compressing the pile I apply pressure of at least about two pounds per square inch throughout at least the greater portion of the area of the pile and preferably throughout substantially the entire area of the pile. In optimum practice I apply pressure of at least about four pounds per square inch and I may apply even greater pressure.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof and a present preferred method of practicing the same proceeds.

In the accompanying drawings I have shown a present preferred embodiment of the invention and have illustrated a present preferred method of practicing the same, in which

Figure 1 is a perspective view of a shipping package of expanded metal lath;

Figure 2 is a more or less diagrammatic view showing the presenting of the loosely piled sheets upon a skid to a press for formation into a shipping package;

Figure 3 is a view similar to Figure 2 showing the piled sheets compressed in the press to the extent indicated in Figure 1 ready for banding; and

Figure 4 is a fragmentary cross-sectional view to enlarged scale of a portion of the shipping package shown in Figure 1.

Figure 1 is a view made from an actual photograph of a shipping package consisting of five

hundred sheets of expanded metal lath compressed and banded to a skid with spreaders beneath the bands at the top of the package. The skid is designated generally by reference numeral 2 and comprises two boards 3 extending lengthwise of the package with their outer edges substantially flush with the side edges of the pile of sheets of expanded metal lath, the boards being laid upon and preferably nailed to three supports 4 shown as being pieces of 4" x 4" lumber having the same length as the width of the pile. Normally sheets of expanded metal lath are about twenty-seven inches wide by about eight feet long; the sheets in the package shown in Figure 1 are of that size. The pile of sheets of expanded metal lath is designated by reference numeral 5. The strands and bonds of the expanded metal constitute both faces of each of the sheets. Expanded metal lath is a very well known commodity of standard construction and it is thought unnecessary to describe it to any greater extent than has been done hereinabove. I believe that the results which I obtain come about through the fact that the strands and bonds of the expanded metal lath are flexible or springy and are disposed at an angle to the general plane of the sheet. This makes possible slight flexing of the expanded metal under pressure whereby it is caused to nest to a very much greater extent than when the sheets are simply piled one upon another. I know of no other material that has this peculiar quality and I take advantage of the peculiar quality of expanded metal lath to package it in the novel way herein described with the advantages referred to. The supports 4 provide spaces 6 therebetween beneath the skid for receiving the supporting arms of any suitable handling apparatus such as an elevator truck as shown in Figures 2 and 3 and designated generally by reference numeral 7.

The press in which the pile of sheets of expanded metal lath is compressed preferably has a bed 8 with slots receiving the supports 4 so that the boards 3 lie directly upon the press bed. The press has a head 9 with slots for receiving the spreaders 10 at the top of the pile. The spreaders 10 may be laid atop the pile after the compressing of the pile has been completed and just before the bands are applied.

A guide 11 is provided behind the press against which the rear face of the pile of sheets is positioned by the elevator truck 7. The elevator truck is preferably provided with a guide 12 opposed to the guide 11. When the skid with the sheets piled loosely thereon is picked up by the elevator truck the face of the pile disposed toward the truck lies against the guide 12. The operator of the truck lifts the skid 2 with the pile of sheets of expanded metal lath 5 thereupon to the requisite height and presents the same between the head 9 and the bed 8 of the press so that the face of the pile disposed rearwardly or away from the elevator truck lies against the guide 11. With the loosely piled sheets thus held between the guides 11 and 12 the press head 9 is forced downwardly to compress the pile of sheets. During the compressing the operator of the elevator truck may move the truck back and forth to agitate the pile of sheets of expanded metal lath by repeatedly striking by the guide 12 the face of the pile of sheets opposed to that guide. Agitation of the pile in that manner promotes nesting or intermeshing of the sheets of expanded metal lath.

The press applies pressure to the pile of sheets of expanded metal lath substantially perpendicular to the planes of the sheets substantially throughout the area of the pile and consolidates the pile and promotes nesting of the sheets. The pressure thus applied is at least about two pounds per square inch and preferably at least about four pounds per square inch. The pile of sheets of expanded metal lath is compressed and consolidated or compacted until its volume has been reduced at least about 20% and desirably at least about 33⅓%.

When the pile of sheets of expanded metal lath has been compressed as above described the spreaders 10 are laid atop the pile and bands 13 are disposed about the pile and about the spreaders 10 and the skid 2 as shown in Figure 1, the bands passing beneath the supports 4, and the bands are drawn tight by any suitable band applying tool. The ends of the bands are fastened together in conventional manner, after which the press head 9 is raised to clear the package and the package is removed from the press bed 8 by the elevator truck 7. The package has the shape and characteristics shown in Figure 1, being of generally right parallelepipedal form and having virtually the characteristics of a box so far as handling and stacking are concerned. Several of the packages may be piled upon one another without danger of their toppling over, which danger always existed in use of the packages of expanded metal lath heretofore employed. The bands are maintained tight by the pressure of the sheets of expanded metal lath against one another and there is no danger of loosening of the bands or shifting of the sheets of expanded metal lath in the package. Moreover, the package takes up materially less space than the packages previously employed. In the packages previously employed the height of the package varied from forty-one to forty-nine inches at the highest point while the lowest point might have been as much as a foot or more lower than the highest point. My compressed package may, for example, have a height of about thirty-one inches which is uniform throughout the package and uniform in different packages. Thus a considerably greater number of my improved packages can be disposed in a given space with great economy in shipping.

While I have shown and described a present preferred embodiment of the invention and have illustrated a present preferred method of practicing the same it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied and practiced within the scope of the following claims.

I claim:

1. A method of packaging for shipment hundreds of sheets of expanded metal lath respectively comprising strands and bonds forming openings of approximately but not exactly the same size and shape so that when the sheets are laid atop one another they do not substantially nest but form a loose pile comprising disposing the sheets atop one another to form a pile, compressing the pile substantially perpendicular to the planes of the sheets throughout at least the greater portion of the area of the pile parallel to the sheets by the application of pressure of at least about two pounds per square inch and thereby reshaping the expanded metal and pressing the sheets into compacted intimate relationship to cause certain of the strands and bonds of certain sheets to intermesh with those of adjacent sheets, whereby to form a compacted

pile of generally right parallelepipedal form and banding the pile while under such pressure to maintain the sheets in said relationship to produce an easily handleable and stackable package.

2. A method of packaging for shipment hundreds of sheets of expanded metal lath respectively comprising strands and bonds forming openings of approximately but not exactly the same size and shape so that when the sheets are laid atop one another they do not substantially nest but form a loose pile comprising disposing the sheets atop one another to form a pile, compressing the pile substantially perpendicular to the planes of the sheets throughout at least the greater portion of the area of the pile parallel to the sheets by the application of pressure of at least about two pounds per square inch and agitating the pile to thereby reshape the expanded metal and press the sheets into intimate compacted

relationship to cause certain of the strands and bonds of certain sheets to intermesh with those of adjacent sheets whereby to form a compacted pile of generally right parallelepipedal form, and banding the pile while under such pressure to maintain the sheets in said relationship to produce an easily handleable and stackable package.

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