

Jan. 13, 1942.

S. AKTABOWSKI

2,269,571

SHEET FEEDER AND METHOD OF USING

Filed Aug. 16, 1941

2 Sheets-Sheet 1

FIG. 1

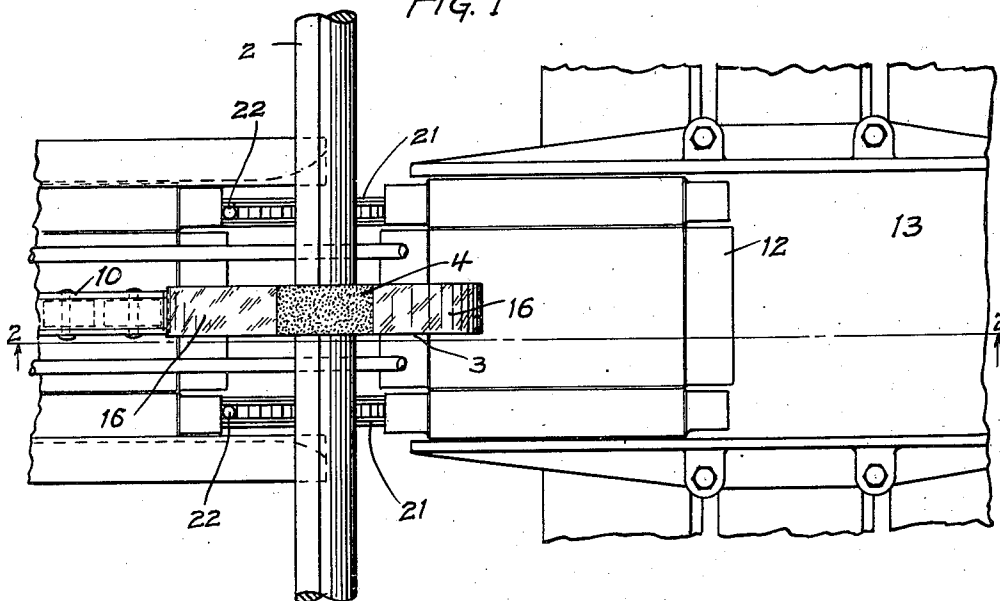
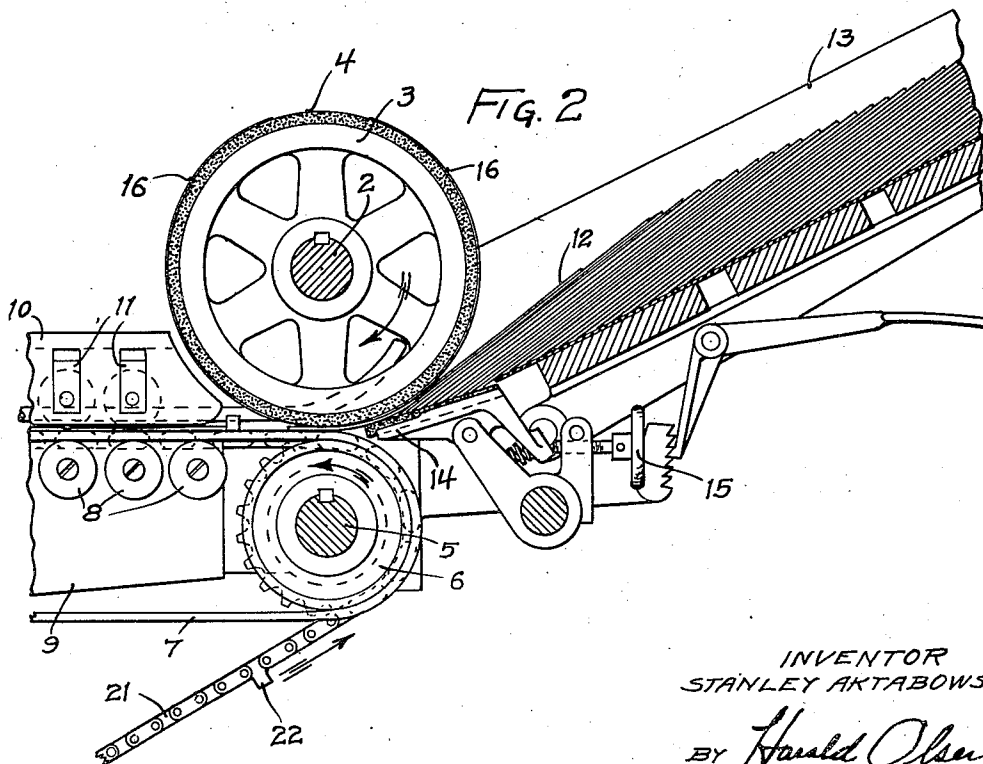


FIG. 2



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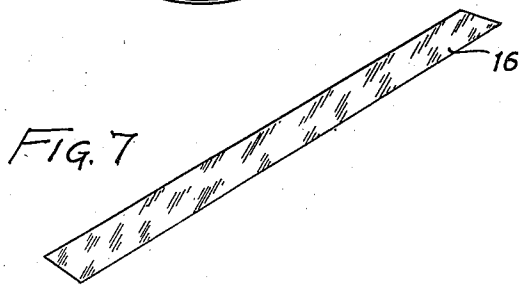
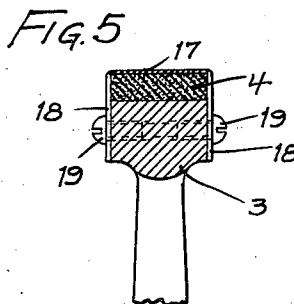
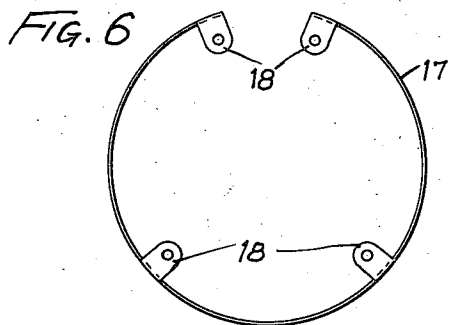
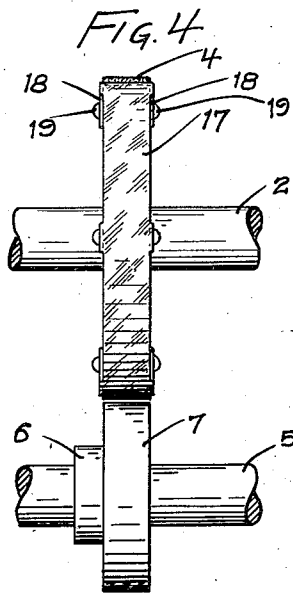
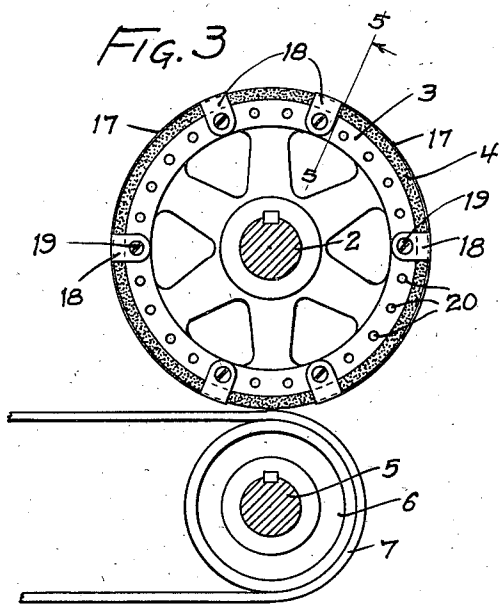
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SHEET FEEDER AND METHOD OF USING

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2 Sheets-Sheet 2



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2,269,571

SHEET FEEDER AND METHOD OF USING

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Application August 16, 1941, Serial No. 407,116

15 Claims. (Cl. 271—39)

This invention relates to the art of sheet feeding; to a feeding wheel; and to the method of using a feeding wheel in combination with a sheet feeding, folding and gluing machine. The method permits the use of a single wheel of relatively simple construction, and so that its friction feeding surface can be quickly modified from a continuous feeding condition to that of a timed feeding condition, respectively, corresponding to a continuous feeding mechanism, and to a timed feeding mechanism in which the sheets are fed from a hopper, one at a time in timed relationship.

Ordinarily, in order to accomplish both continuous or timeless feeding and timed feeding, two separate feed wheels are required, and time must be consumed in changing from one type of wheel to the other. By the use of this invention only a single wheel of the continuous feeding type is used and the invention provides a method by which this type of wheel can be quickly modified for timed feeding.

It will be understood that various materials having nonfriction feeding surfaces can be used, so that there is no intention to entirely limit the invention, either to Cellophane or to metal with a polished, nonfriction feeding surface.

The application of my invention can be best understood by referring to Staude Patent No. 2,008,049 in which Figure 3 shows the conventional type of feed wheel used for "timed" feeding and Figure 4 shows the conventional type of feed wheel for continuous feeding.

In order to accomplish both continuous or "timeless" feeding and timed feeding, two separate feed wheels are required, one with a continuous friction feeding surface, and another having blocks set in the periphery, each having a friction feeding surface.

There is difficulty in securing a suitable friction material to the metal block retainers without providing an open space for a distance of one-half inch which is utilized for clamping or otherwise securing the friction material to the metal block.

There is a further difficulty in shimming up the metal block the proper distance to conform to the periphery of the feed wheel. If the friction material is vulcanized to the metal block, the operation is expensive because it must be renewed more or less frequently.

An object of my invention is to overcome all of these difficulties and use a simple continuous or timeless feed wheel provided with a friction surface over the entire periphery of the wheel,

to be used in that condition for continuous or timeless feeding. When it is required that the feed wheel deliver only one or two sheets per revolution, thereby feeding in "timed" relation, I cover up so much of the continuous friction surface as is not desired, by means of a strip of cellulose material which is provided on one side with never-drying glue and which can be purchased on the open market as ordinary cellulose tape. Or other material may be used. I may cover so much of the surface of the friction material on the feed wheel as is not required, by a thin polished metal material, to which are welded suitable ears as means by which to fasten the metal to the feed wheel.

My invention can be best understood by referring to the drawings and specification. In the drawings—

Figure 1 represents a plan view of a machine showing my feed wheel mounted on a driving shaft, and showing the application of the thin cellulosic material to adapt the feeder for "timed" feeding. The figure also shows a portion of the feed hopper and the conventional timed feed chains which receive the blank after the timed feed wheel has fed the top sheet from the pile;

Figure 2 is a vertical longitudinal section on the line 2—2 of Figure 1;

Figure 3 is a side view of a modification of the feed wheel, to which for timing purposes there has been applied a thin metal strip to cover up that portion of the friction material on the feed wheel that is not desired, and thus convert the continuous feed wheel into a timed feeding wheel;

Figure 4 is an end view of Figure 3;

Figure 5 is a detail section on the line 5—5 of Figure 3;

Figure 6 is a side view of the thin metal material used to cover up the friction belt for "single" feeding, that is, feeding one sheet per revolution of the feed wheel; and

Figure 7 is a detail perspective of a section of the cellulose tape, such as is used in Figures 1 and 2.

Referring to the drawings, 2 is a feed wheel shaft driven from any suitable source and upon which is mounted a feed wheel 3 of the continuous feeding type. The feed wheel 3 is covered with a friction surface 4 usually in the form of a rubber band cemented to the feed wheel. Below the feed wheel is a shaft 5 having a pulley 6 having a belt 7, which belt runs over idle rollers 8 supported on a frame 9. Above

the belt 7 is a carrier 10 having idle rollers mounted in yokes 11 to contact the belt 7.

When the sheets 12 are to be fed from the hopper 13 in a continuous untimed stream, the sheet passes between the friction belt 4 and the retard member 14 until the sheet is gripped by the friction surface 4 and the belt 7, and is then fed forward by the belt 7 and the rollers in the yokes 11. Suitable adjusting means generally indicated at 15 are provided for adjusting the retard member 14 relatively to the friction surface 4 to permit the passage of only a single sheet at a time.

When I use the feed wheel 3 and the continuous friction surface 4 for continuous untimed feeding, I use the belt 7 and the carrier 10 for receiving the blanks 12 from the feed wheel 3 in a continuous stream, and remove the timing chain indicated at 21. If now it is desired to convert the timeless feed wheel into a timed feed wheel, I cover a portion of the friction surface of the friction material 4 with either the thin cellulosic material 16 as shown in Figures 1 and 2, or with the metallic covering 17 shown in Figures 3, 4, 5 and 6.

When the metallic covering 17 is used, ears 18 are welded to the thin pliable material on each side and the same are secured to the feed wheel 3 by suitable screws 19 which are fitted in threaded holes 20, which are evenly spaced around the periphery of the feed wheel.

The purpose in having these holes evenly spaced is that when as a result of timed feeding the exposed friction surface becomes worn, I can advance the thin metallic material to cover the worn area and secure the material by the use of other holes and so as to expose other portions of the friction surface that have not been worn. When this is done I must, of course, re-time the wheels, which merely means that I disengage a spur gear (not shown) and swing the feed wheel around so that the newly exposed friction surface will be in proper timed relation as before. I have not shown the means of adjustment in the drawings because the procedure will be clear by reference to Staude Patent 2,008,049.

In practice, when using the timed feed wheel as shown in Figures 1 and 2, I raise the carrier 10 and the rollers and yokes 11 away from the belt 7 so that they do not contact the blank and rely on the feeding lugs 22 of the timed chain 21 to engage the rear of the blank and move the blank in timed relation away from the feeder.

The drawings Figures 1 and 2 show both the carrier 10 having the idler rollers mounted in yokes, and also the timed feed chain 21 with the feed lugs 22. It is obvious, however, that I do not simultaneously use the mechanism for advancing the blanks in timeless relation, and the mechanism for advancing the blanks in timed relation. To simplify the illustration, I have not thought it necessary to show each of these advancing means separately, because anyone skilled in the art will understand which advancing mechanism is required for timeless operation, and which advancing mechanism is used conventionally for a timed operation.

I do not limit my invention to the precise construction shown because obviously various modifications may be made of my construction without departing from the spirit of my invention.

I have found in practice that thin cellulosic material of the proper width, for example, one and three-quarters inches wide, can be pur-

chased at any stationery store and is remarkably satisfactory. With such material from 250,000 to 500,000 sheets can be fed with a single application of the tape, and this so-called "run" is usually larger than the average "run" in the box plant, on a particular size carton, where timed feeding is required and before timeless feeding is again needed.

Therefore, after operating on timed feeding with the gummed tape, I convert the feed wheel for timeless feeding by merely pulling off the gummed tape. When I want to reconvert the feed wheel to timed feeding, I use a new piece of tape because it is inexpensive, and I have found that a great saving of set-up time is obtained by this simple method. I obviate the need of adjusting the friction surface when the feed wheel is set up for timed feeding to conform to the outer periphery of the feed wheel, because the friction surface of my invention is always at the proper level.

It is to be understood that there is no intention to entirely limit the invention to the use of the specific materials mentioned, because the broad invention consists in modifying the continuous feeding surface of a feeding means by the application of some easily applied and easily removable material for rendering a part or parts of said feeding surface incapable of feeding. Of course, all specific materials mentioned are also claimed. For example, "Scotch tape," which is gummed and transparent, is a very good material as a non-feeding material, and so also is Cellophane, properly gummed. Both the tape and the Cellophane may be quickly and easily applied and may be as quickly and easily removed.

Time of change-over is an important element, in addition to the fact that no wheel using blocks need be used. Thus, only a wheel of a single relatively cheap kind can be used, and no time in change-over of wheels is lost.

Gummed paper with a nonfeeding surface may be used, and any metal having a suitable non-friction quality may be used. Ordinarily gummed paper may be used and oil or shellac may be applied to lengthen its life and to enhance its nonfeeding quality. Some material which can be painted on may be used, for instance, a shellac which can be applied by brush and removed by a suitable solvent.

Although in the drawings I have only shown my invention applied to illustrate single time and double time feeding, it will be understood that triple time feeding and time feeding by a greater number of exposures of the surface 4 can be accomplished.

It will further be noted that by the use of the openings 20 and the proper spacing and by having standard lengths of metal material 17, sets of elements 17 can be provided shorter or longer according as a greater or lesser number of exposures of the material 4 are required. The openings 20 and the lugs 18 facilitate the symmetrical spacing of the element 17 so that when using the metal strip or its equivalent it will be relatively easy to select the proper length of the metal with the proper lugs 18 and to get proper spacing by registering the openings in the lugs with the openings 20.

What I claim is:

1. A method for interrupting the circumferentially continuous feeding action of a feeding surface of a sheet feeding wheel to render only part of said surface effective for feeding, which comprises covering a part of said surface with a ma-

terial having a relatively nonfriction feeding surface.

2. A method for interrupting the circumferentially continuous feeding action of the feeding surface of a sheet feeding wheel to render only parts of said surface effective for feeding, which comprises covering said friction feeding surface with sections of material spaced from one another and each having a relatively nonfriction feeding surface.

3. A method for interrupting the circumferentially continuous feeding action of a feeding surface of a sheet feeding wheel to render only part of said surface effective for feeding, which consists in covering said friction feeding surface with a single strip of material having a relatively nonfriction feeding surface, and in a manner to leave exposed only a single area of said friction feeding surface of the wheel.

4. A method for cheapening the construction and extending the life of a feeding wheel which is to be used alternately for continuous and intermittent feeding of sheet material, which comprises providing the wheel with a band of material capable of continuous friction feeding, and then covering a part of the friction feeding surface of the band with material having a surface which as used is relatively incapable of friction feeding and applying such material in a manner to leave exposed only a predetermined surface area of said friction feeding material.

5. A method for cheapening the construction and extending the life of a feeding wheel which is to be used alternately for continuous and intermittent feeding of sheet material, which comprises providing the wheel with a circumferentially continuous band of material capable of friction feeding, and then covering parts of the friction feeding surface of the band with a section or sections of material having a surface which as used is relatively incapable of friction feeding, and applying said section or sections in a manner to leave exposed only a predetermined surface area or surface areas of said friction feeding material.

6. A method for cheapening the construction and extending the life of a feeding wheel of the continuous feeding type which is to be used for the feeding of sheet material, which comprises providing the wheel with a circumferentially continuous band of material capable of friction feeding, and then covering a part of the friction feeding surface of that band with material having a surface which as used is relatively incapable of friction feeding, so as to expose only a predetermined area of said friction feeding material, and then shifting said antifriction material circumferentially of the friction material to expose new areas of the latter material after the previously exposed areas have had a predetermined amount of usage.

7. A method for interrupting the circumferentially continuous action of a feeding surface to render only a part of said surface effective for feeding, which comprises covering part of said surface with a nonfriction feeding material so attached as to be easily and quickly removed.

8. In a sheet feeding machine having a feeding wheel having a circumferentially continuous friction feeding surface adapted to act upon the topmost sheet of a forwardly fanned-out pile of sheets, a strip of suitable material applied and partly covering the friction feeding surface of

said wheel, and having an outwardly faced nonfriction feeding surface.

9. A machine having a feed wheel having a circumferentially continuous friction feeding surface, means for supporting a pile of sheets so that said surface can contact and consecutively forwardly feed the uppermost sheet of the pile, and a strip of Scotch tape so disposed in relation to said feeding surface as to allow only a predetermined portion of said surface to act in its friction feeding capacity.

10. A machine having a feed wheel having a circumferentially continuous friction feeding surface, and a thin strip of metal so disposed in relation to said feeding surface as to allow only a predetermined portion of said surface to act in its friction feeding capacity, and means by which the strip can be detachably secured to the wheel at any one of a plurality of different circumferential positions.

11. A feeding wheel for sheet material having a circumferentially continuous band providing a friction feeding surface, said wheel having passing axially therethrough a circumferential row of equally spaced openings threaded at opposite ends, a thin sheet of nonfriction feeding material masking a portion of said friction feeding surface of the band and having lateral extensions on both sides, each extension having an opening, the arrangement being such that proper simultaneous registration of openings of the extensions and of the wheel will occur for circumferentially adjusted positions of the strip so that screws may act to secure the extensions to the wheel.

12. A feeding wheel for sheet material having a circumferentially continuous band providing a friction feeding surface, said wheel having in each opposite face a circumferential row of threaded openings, the openings of both rows being equal in number and spacing and pairs of openings at opposite sides of the wheel being axially aligned, and each row being concentric with the friction feeding surface of the band, and a strip of thin sheet material masking a portion of said friction feeding surface of the band, and having lateral extensions on both sides, each extension having an opening, said extension openings arranged to be simultaneously registrable with the corresponding openings of the row, and screws passing through the openings of the extensions and into the threaded openings of the wheel, the arrangement being such that proper simultaneous registration of the openings of the extensions can occur for circumferentially adjusted positions of the strip.

13. A sheet feeder having a wheel having a circumferentially continuous friction feeding surface, and a material covering a part of said surface, said material providing a nonfeeding surface, and being of a nature which can be easily and quickly applied and easily and quickly removed.

14. A sheet feeder having a feeding wheel having a circumferentially complete friction feeding surface and a piece of material covering part of said feeding surface releasably secured by adhesive and providing a nonfriction feeding surface.

15. A sheet feeder having a feeding wheel having a friction feeding surface and a piece of metal covering part of the feeding surface of the band and having a nonfriction feeding surface.

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