Aug. 7, 1928. 1,679,717

J. W. GREER

CONVEYER

Filed Nov. 10, 1924 2 Sheets-Sheet 1

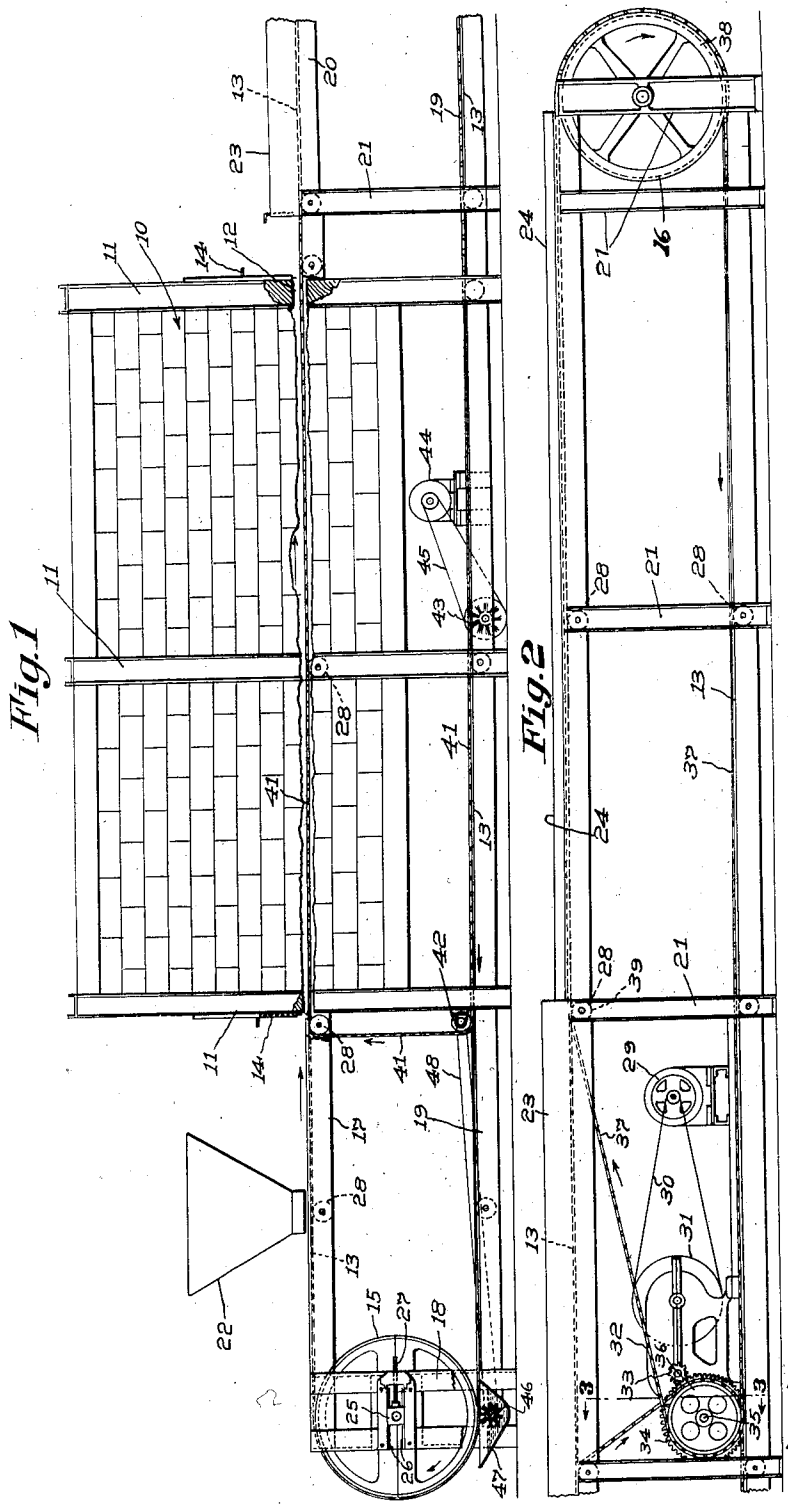


Fig. 1

Fig. 2

INVENTOR:
Jesse W. Greer
BY Robert G. Harris
ATTORNEY

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Fig. 3

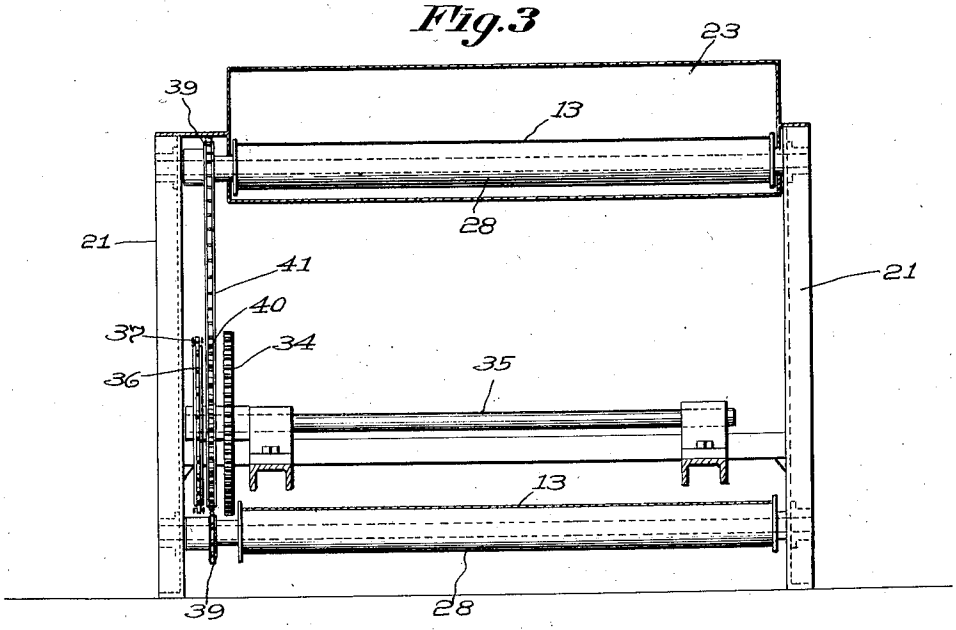
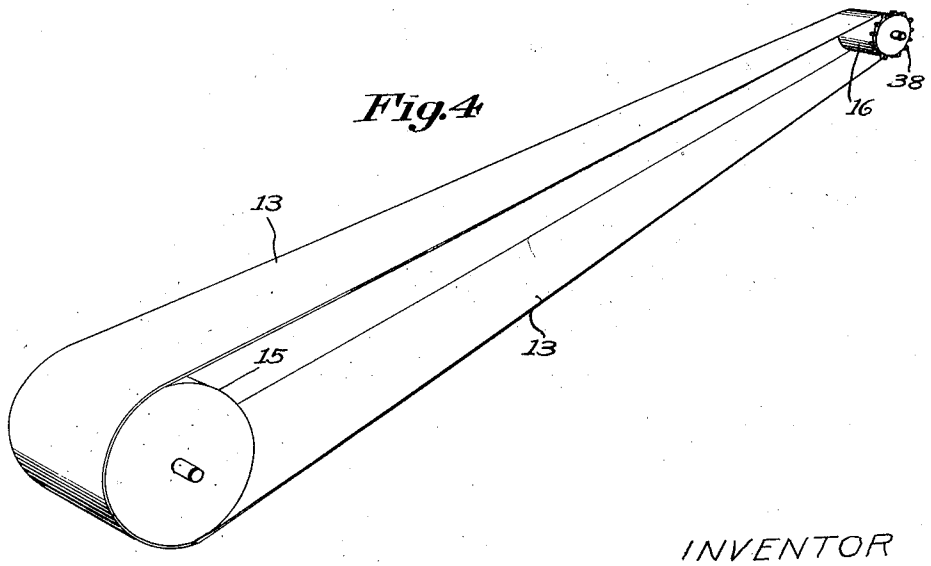


Fig. 4



INVENTOR
Jesse W. Greer
BY Robt. P. Harris.
ATTORNEY

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UNITED STATES PATENT OFFICE.

JESSE W. GREER, OF CAMBRIDGE, MASSACHUSETTS.

CONVEYER.

Application filed November 10, 1924. Serial No. 748,910.

This invention relates to a conveyer in the form of a metal belt for carrying articles thru a heated oven, and to the construction by which articles of food in their uncooked condition may be deposited directly upon the metal conveyer and carried thereby thru an oven so that they will be cooked while passing thru the oven.

Various forms of traveling carriers and conveyers have been proposed heretofore, but the well known types of conveyers will not meet the requirements of the present case, due to the injurious effect of the heat of an oven upon the mechanism of a traveling carrier, and due also to the nature of the supporting surface required to receive the articles of food to be baked.

Heretofore cakes, crackers, biscuits and other articles of food have been placed in pans for baking. In accordance with the present invention the use of these pans is no longer necessary, and an important feature of the present invention resides in an endless sheet metal belt having a smooth surface upon which the cakes, crackers, biscuits or other articles of food, in their uncooked condition, may be directly placed and conveyed thereby thru the baking oven. The conveyer should travel at such a speed that the articles of food thereupon will be sufficiently baked during their passage thru the oven. Another feature of the invention therefore resides in means for supporting the sheet metal belt and for driving it at various different speeds, depending upon the length of time the articles upon the belt are to remain in the oven.

Other features of the invention reside in means for brushing from the belt the crumbs which may adhere thereto after the articles of food have been removed; in means for greasing the food receiving surface of the belt; in a cooling chamber thru which the articles of food pass upon leaving the oven; and in packing tables disposed along the belt.

The various features of the invention and novel combination of parts will be best understood from the following description when read in connection with the accompanying drawings illustrating one good practical form of the invention.

In the drawings:—

Fig. 1 is a side elevation of the conveyer of the present invention shown supported so that its upper run will pass thru an oven.

Fig. 2 is a continuation of Fig. 1, and shows the upper run of the conveyer passing thru a cooling chamber and extending along a packing table.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; and

Fig. 4 is a perspective view of the sheet metal belt of the present invention and the supporting drums around which it passes.

The metal conveyer belt of the present invention is well adapted to convey various articles thru an oven, but it is designed more particularly for use by manufacturers of biscuits, cakes, crackers and other articles of food. And in accordance with the present invention, the uncooked biscuits or the like may be deposited directly upon the smooth surface of the sheet metal belt at one side of the oven to be conveyed slowly thru the oven by the belt so that they will be sufficiently baked upon leaving the oven. They may then be carried by the belt thru a cooling chamber, and upon leaving this chamber they are ready to be packed in boxes.

In the drawing, 10 is an oven of any suitable or well known construction having the upright supports 11, and at each end of the oven is provided an opening 12 thru which the upper run of the metal belt 13 may pass. The size of the openings 12 may be varied by adjusting the sliding doors 14.

The entire belt 13 may be formed of a long strip of thin sheet metal that passes around the spaced drums 15 and 16, and the upper and lower runs of the belt are supported at various points between the drums 15 and 16. The entire belt conveyer may be many feet in length so that the uncooked biscuits, or the like, may be placed upon the upper run of the belt near one drum 15, and be baked and cooled ready for packing in boxes as they approach the other drum 16.

The conveyer is provided with a supporting frame, conveniently formed of upper rails 17 extending a short distance from the left-hand side of the oven 10, and which are held in their elevated position by the uprights 18, and the frame is provided with lower rails 19 which may extend under the furnace, as shown. The long conveyer supporting frame at the right-hand end of the oven may be formed of upper longitudinally extending rails 20, held in spaced relation to the lower rails 19 by uprights 21.

The upper run of the belt 13 travels thru the furnace in the direction indicated by the arrows, and at the left-hand side of the oven is shown a hopper or depositor 22 which is constructed to place the uncooked biscuits, small cakes, or the like, upon the traveling belt so that they will be conveyed thru the oven 10, and the conveyer is operated by means to be described at such speed that the biscuits or the like will be sufficiently baked by the time they pass out of the oven at the right-hand end thereof. The belt with the hot biscuits or the like thereupon then passes into the cooling chamber 23, thru which, if desired, a current of air may be passed to cool the articles of food on the belt 13. As the biscuits or the like leave the cooling chamber 23, they are sufficiently cool to be packed in boxes, and packing tables 24 are therefore provided upon one or both sides of the traveling belt and extend from the right-hand end of the cooling chamber to a position near the drum 16. As the upper run of the belt passes along the tables 24 the biscuits, cakes, or the like may be removed from the belt by girls working at the tables, and placed by them in boxes. As a result of the present construction, the biscuits or the like travel continuously from the time they are placed upon the belt by the hopper 22 until they are removed from the belt by hand, baked, cooled, and ready for consumption.

The drum 16 at the right-hand end of the supporting frame is rotatably supported by the end uprights 21, and the drum 15 at the left-hand end of the supporting frame is rotatably supported by the uprights 18. It may be desirable to vary the tension of the endless belt 13, and to this end, in the construction shown, the supporting shaft of the drum 15 is rotatably mounted in blocks 25, which are slidably mounted in the guideways 26, and the blocks 25 may be moved to or from the belt tightening position by the operating screws 27. It is necessary to support both the upper and lower run of the belt at various points, and in the construction shown this is accomplished by rollers 28 positioned along the upper and lower runs of the belt.

Various means may be provided for driving the conveyer belt of the present invention, and since the belt is relatively long, the same should be driven at a plurality of points, and in the construction shown sprocket chains are employed to drive the drum 16 and also the supporting rolls 28. It may be desirable to drive the belt 13 at different speeds to vary the length of time required to convey articles upon the belt through the oven 10. Any suitable variable speed drive may be employed to this end, and in the construction shown an electric motor 29 is mounted below the cooling chamber 23, and this motor, by means of a belt 30, drives a pulley 31 of the speed varying device 32, and a driving pinion 33 of the speed varying device meshes with and drives a large gear 34 rigidly secured to a transversely extending shaft 35. The shaft 35 is provided with a sprocket 36, and a sprocket chain 37 passes about the sprocket 36 and about the sprocket 38 rigidly secured to the drum 16, so that the chain 37 is driven by the sprocket 36 and drives the drum 16. The sprocket chain 37 serves also to rotate a number of supporting rollers 28, and to this end the rollers are provided with small sprockets 39 which are engaged and driven by the chain 37. It may be desirable to drive the supporting rolls 28 which are disposed at the left hand side of the driving shaft 35, and to this end a second sprocket 40 is secured to the shaft 35 and this sprocket drives a chain 41, the lower run of which passes below the oven to rotate the rollers which support the lower run of the belt 13. This chain then passes upwardly around the sprocket 42 to the sprocket of an upper roller 28, whereupon the upper run of the chain 41 passes through the oven to rotate the supporting rolls therein and returns to the driving sprocket 40. By providing the two driving chains just described, one of which extends in a right-hand direction from the driving shaft 35, and the other extends in a left-hand direction from this shaft, as many of the supporting rolls 28 as desired may be positively driven by these chains, so that the supporting rolls will help drive the endless belt 13 as well as support the same.

After the biscuits, cakes, or the like, have been removed from the upper run of the belt 13, crumbs and other small particles may stick to the belt. It is desirable to clean the belt before uncooked biscuits or the like are again deposited upon this belt, and to this end in the construction shown a rotating brush 43 is provided which may be mounted below the lower run of the belt, as shown in Fig. 1, to brush the lower surface of the same and this belt may be driven by an electric motor 44 having a driving belt 45. In many cases it will be desirable to grease or oil the biscuit receiving surface of the endless belt, and this is accomplished in the present case by a brush 46 rotatably mounted below the drum 15. Oil or grease is supplied to this brush by the receptacle 47 and the brush 46 may be driven from the sprocket 42 by a chain 48.

From the foregoing it will be seen that the baking operation may be carried on continuously, and that the biscuits, cakes, or the like, when placed upon the traveling belt 13 by the hopper 22, are passed thru the oven 10 which bakes them, after which they are passed thru the cooling chamber 23,

which cools them ready for packing, and as they are conveyed along the tables 24, they are removed from the belt and placed in boxes or containers, ready for the market.

What is claimed is:—

1. In a machine of the class described, in combination, a long sheet metal belt for conveying articles of food successively through a baking and cooling chamber and having an upper and a lower run, an oven, a cooling chamber and a packing table arranged along the upper run of the belt, rollers disposed at intervals along the upper run of the belt to support and drive the same as it passes through the oven and cooling chamber, a power shaft positioned between the upper and lower runs of the belt intermediate the ends of a belt run, and driving chains extending in opposite directions from said shaft lengthwise of the upper run of the belt and operable by the shaft to drive said rollers from a single source of power disposed intermediate the ends of a belt run.

2. In a machine of the class described, in combination, a long sheet metal belt for conveying articles of food successively through a baking and cooling chamber and having an upper and a lower run, an oven and a cooling chamber arranged along the upper run of the belt, rollers disposed at intervals along the upper run of the belt to support and drive the same as it passes through the oven and cooling chamber, a power shaft positioned between the upper and lower runs of the belt to extend transversely thereof intermediate the ends of a belt run, endless driving chains extending in opposite directions from said shaft and one having an upper run extending through the oven and a lower run extending outside of the oven, and the chains being operated by said shaft to drive said rollers from a single source of power disposed intermediate the ends of a belt run.

3. In a machine of the class described, in combination, a long sheet metal belt for conveying articles of food successively through a baking and cooling chamber and having an upper and a lower run, an oven and a cooling chamber arranged along the upper run of the belt, rollers disposed at intervals along the upper run of the belt to support and drive the same as it passes through the oven and cooling chamber, belt supporting drums at the opposite ends of the belt run, a power shaft positioned between the upper and lower runs of the belt to extend transversely thereof intermediate the ends of a belt run, and endless driving chains extending in opposite directions from said shaft lengthwise of the upper run of the belt and operable to positively drive one of the drums and the rollers from a single source of power disposed intermediate the ends of a belt run.

In testimony whereof, I have signed my name to this specification.

JESSE W. GREER.