

Nov. 22, 1932.

E. K. STANDISH

1,888,477

BRAIDING MACHINE

Filed April 1, 1931

3 Sheets-Sheet 1

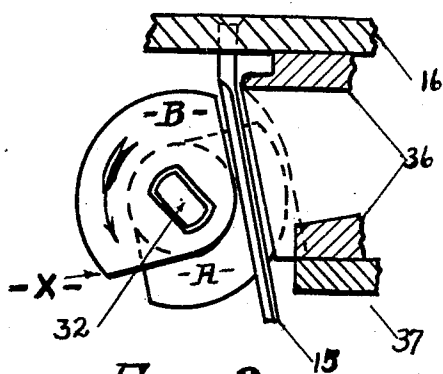


FIG. 3-

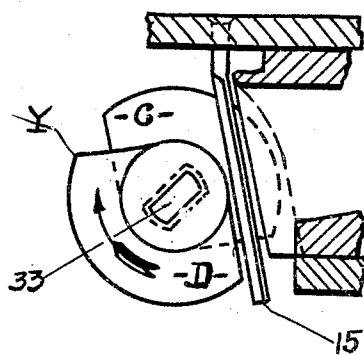


FIG. 4-

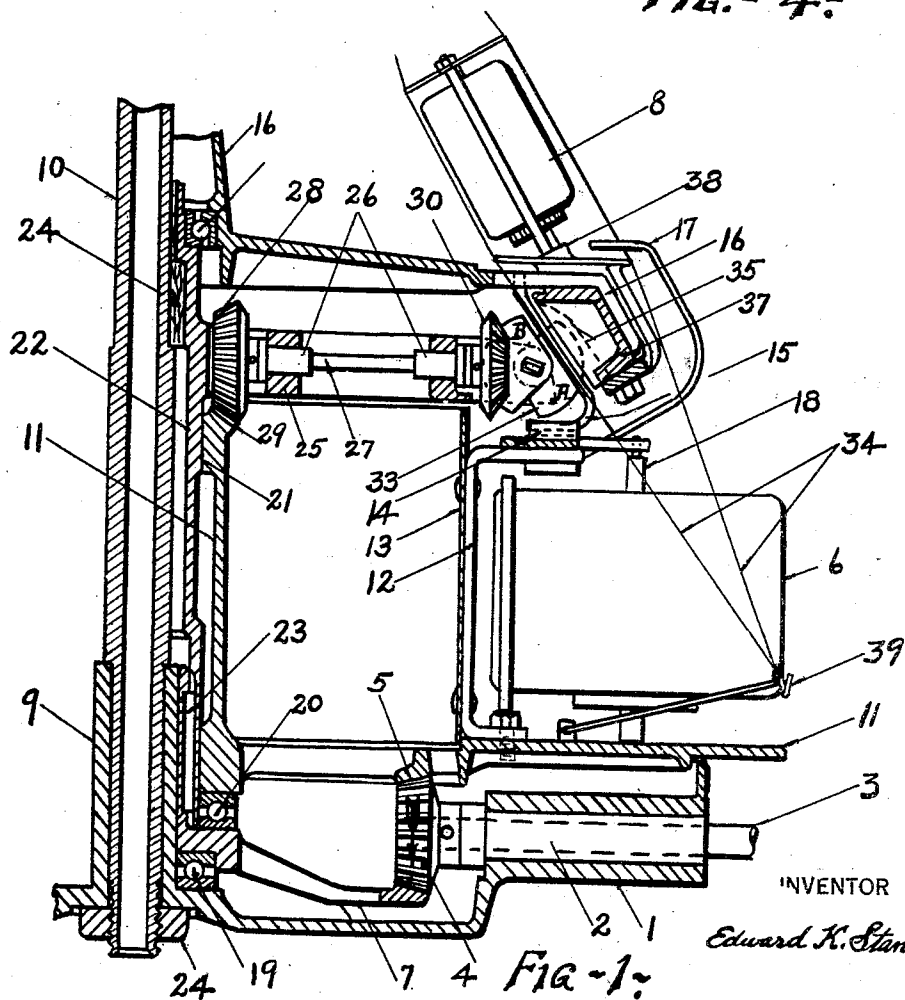


FIG. 1-

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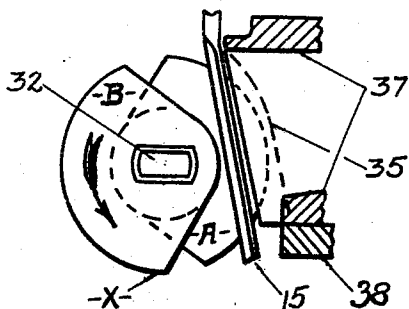


Fig. 5-

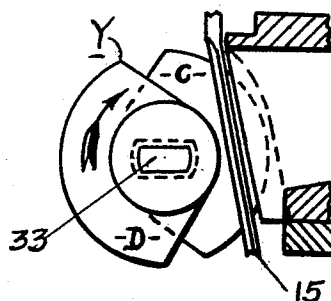


Fig. 6-

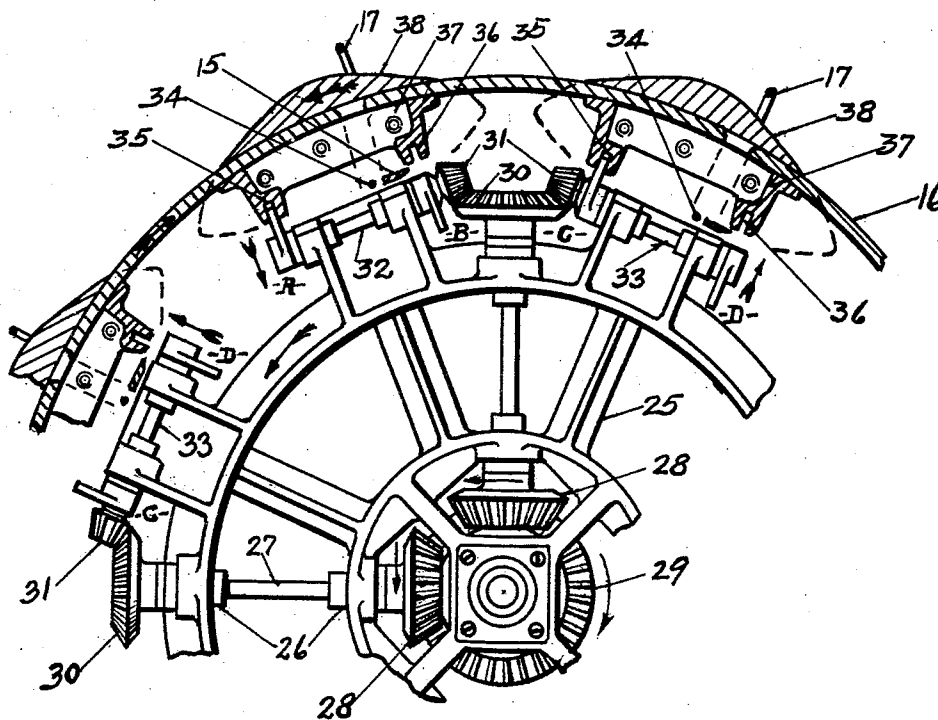


Fig. 2-

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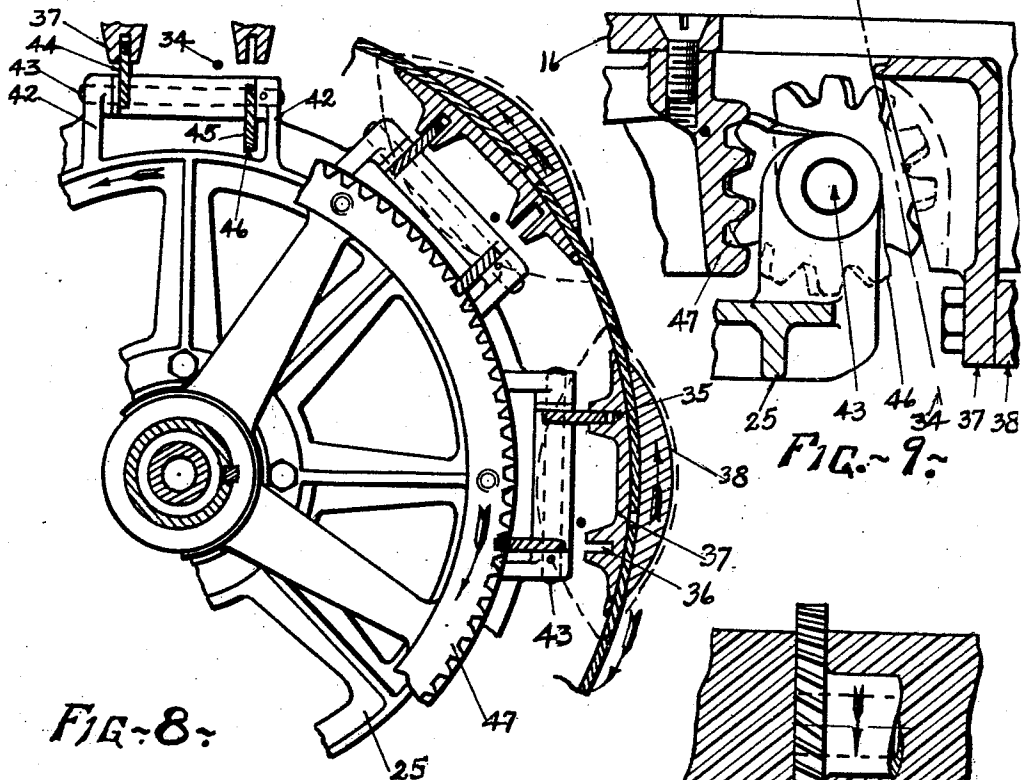


FIG. 8~

FIG. 9~

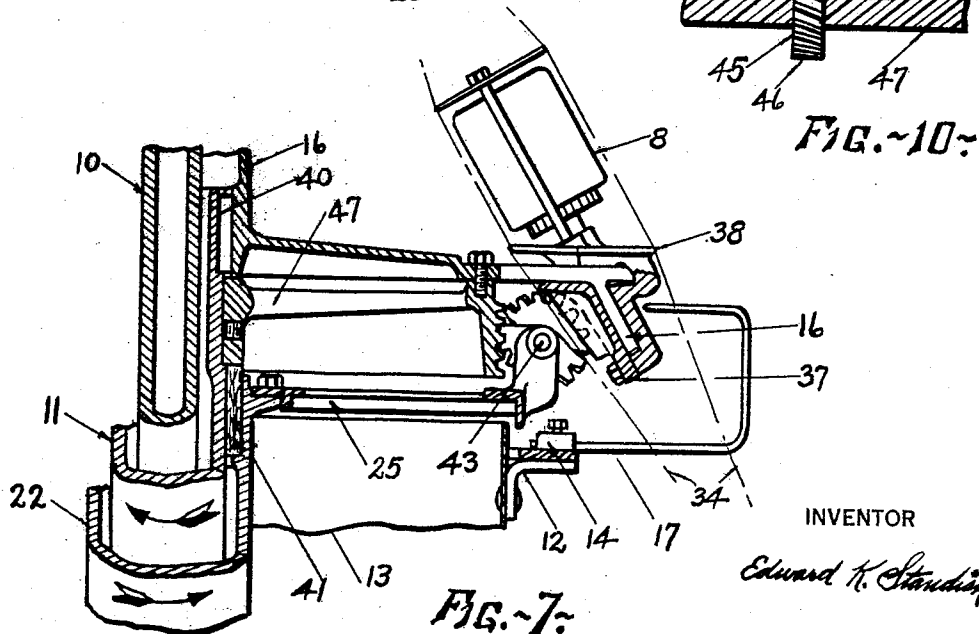


FIG. 10~

FIG. 7~

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BRAIDING MACHINE

Application filed April 1, 1931. Serial No. 526,869.

This invention relates to an improved method of driving the yarn supply carriers in a braiding machine and is especially adapted to the rotary or circular orbit type of machine where the yarn from one set of supplies is passed either inside or outside of the yarn packages of a second set of supplies as required to braid, and where both sets of supplies rotate in opposite directions about a common center.

More specifically the invention discloses new and improved means for passing yarn threads from one set of yarn supplies between a second set of yarn supply carriers moving in the opposite direction and the driving means for said second set, by the use of a rotary motion and discs having interrupted sectors and continuous sections substantially semi-circular in shape and adapted to secure interrupted contact with slots on said carriers and to maintain a continuous push or pull between the driving means and each of said carriers, and at the same time to allow ample clearance and time for passing the yarn between said driving means and carriers.

There is also disclosed a simplified driving means for both sets of supplies.

The invention as specifically shown is hereinafter described with reference to the accompanying drawings in which

Fig. 1 is a sectioned elevation of one type of drive.

Fig. 2 is a plan view of the carrier drive shown in Fig. 1.

Figs. 3, 4, 5, 6 show in detail various positions of the driving discs and the ample clearance and time allowed for passage of the thread.

Fig. 7 is a sectioned elevation of a simplified drive for the discs.

Fig. 8 is a plan view of Fig. 7.

Figs. 9 and 10 show enlarged views of the driving disc and gear, shown in Figs. 7 and 8.

Similar numerals refer to similar parts throughout the drawings, and the normal direction of rotation of the various moving parts are indicated by arrows.

The machine as specifically disclosed in Fig. 1 has a base —1— having a suitably bushed hole —2— for a drive shaft —3—

having a bevel pinion —4— on its inner end.

This bevel pinion —4— meshes with a bevel gear —5— adapted to drive the outer, or as shown, the lower set of yarn supplies —6— in one direction, and also meshes with a bevel gear —7— adapted to drive the inner, or as shown, the upper set of yarn supplies —8— in the opposite direction, both sets rotating about a common center.

This center of the base —1— has an upwardly extending portion —9— suitable for holding a hollow central post —10— locked by nut —24—.

In the specific construction disclosed in Figs. 1 to 6, the outer yarn supplies —6— are carried on the outer carrier —11— mounted to rotate on bearings —20— and —21—. This outer carrier has suitable upwardly extending bars —12— attached to a thin casing —13—.

A ring-shaped casting —14— is attached to the upper part of the bars —12— and has suitable holding means for the driving bars —15— which are also secured to the inner carrier raceway —16—, thus causing it to rotate as a unit with the outer carrier —11—.

These driving bars —15— are thin so as to pass between the inner carriers —38— and their driving means at the same time that the threads —34—, coming from the outer supplies —6— through the loops on the lever —39—, are passed.

Also attached to the ring-casting —14— is a suitable yarn guide —17—, and a support for the upper end of the outer package spindle —18—.

The bevel gear —7— resting on a suitable bearing —19— has an upwardly extending sleeve —22—, preferably keyed to it by key —23—, and carrying a bearing —24— at its upper end.

Fastened to, or part of, the sleeve —22— is a suitable driving plate or bracket-casting —25—, Figs. 1 and 2, having bearings —26— in which are mounted shafts —27— having bevel pinions —28— on their inner ends meshing with a bevel gear —29— which rotates with the outer carrier —11—.

On the outer ends of shafts —27— are bevel gears —30— each meshed with two

bevel pinions —31—, Fig. 2. These bevel pinions drive disc shafts —32— and —33—.

Mounted on or a part of these disc shafts are discs —AB— on one shaft —32— and —CD— on shaft —33—. Each of these discs has a sector removed and each pair of discs is so located on its shaft that while the yarn —34— and driving bars —15— are passing by the cleared sectors on discs —B— and —D—, the sides of the discs —A— and —C— are in contact with the slots —35— of the inner carrier shoes —37— which slide around inside the run of the raceway —16— and drive the inner carriers —38—.

With this construction shafts —32— and —33— rotate in opposite directions and the discs are timed so that discs —A— and —C— are in slots —35— when discs —B— and —D— are clear, or discs —B— and —D— are in the slots when discs —A— and —C— are clear.

In Figs. 3, 4, 5, 6, the points —x— and —y— of the discs will enter their respective slots at about the same instant and one disc of each pair is always driving an inner carrier.

Assuming the braider has eight inner carriers then the shafts —32— and —33— will be geared to make eight revolutions for each one revolution of the outer carrier —11— and gear —29—.

Therefore since the distance from center line to center line of slots —35— and —36— in each inner carrier shoe —37— equals about one-sixteenth of the whole circumference only one-half revolution of shaft —32— or —33— will be required to clear the yarn —34— as it passes each slot.

In the simplified drive shown in Figs. 7, 8, 9, 10, the sleeve 11 is rotated with the outer carrier and the sleeve —22— rotates the inner carriers in the opposite direction by suitable means located in the base —1—, but not shown.

By this construction the sleeve —11— can be fastened directly to the inner carrier raceway —16— by the key —40— and the driving bars —15— are eliminated.

The sleeve —22— carries a bearing —41— and is attached to or part of the bracket-casting —25—.

This bracket-casting —25— has on its outer periphery suitable supports —42—, Fig. 8, for a stationary shaft or stud —43—, Figs. 7 and 8.

Rotatably mounted on shafts —42— are the interrupted or semi-circular discs —44— and —45— preferably made from one piece with a sleeve of smaller diameter connecting them.

In place of the bevel gears shown in Figs. 1 and 2, spiral gear teeth —46— are cut on the outer periphery of the discs, the teeth on each pair being cut as though on a single cylinder. Some of these gear teeth —46— on each pair

of discs are always in mesh with a large spiral gear —47— which may be suitably fastened to and/or rotates with the sleeve —11— and raceway —16—.

The discs —44— and —45— make eight revolutions for one revolution of the spiral gear —47— if there are eight inner carriers, therefore timing is maintained as described for the construction shown in Figs. 1 to 6.

Obviously the essential feature of this drive can be obtained in various forms without departing from the scope of the invention.

Therefore, without limiting myself to the precise construction shown, what I desire to secure by Letters Patent is the following:

1. In a braiding machine, spool-carrier driving means, essentially comprising slots on said carriers, discs mounted to rotate in said slots, spiral gear teeth on the periphery of each of said discs, and a spiral gear mounted to move in a direction opposite to the direction of said spool-carriers and to mesh with the teeth on the periphery of each of said discs.

2. In a braiding machine, spool-carriers having driving means essentially comprising a plurality of interrupted discs having gear teeth on their outer periphery, slots in said spool-carriers each adapted to receive one of said discs when driving one of said carriers, and a spiral gear mounted to move in a direction opposite to the direction of said spool-carriers and to drive each of said discs into and out of contact with its respective slot.

3. In a braiding machine, spool carrier driving means essentially comprising a spiral driving gear mounted to rotate in a direction opposite to the spool carriers, a pair of semi-circular discs located diametrically opposite each other with respect to their common axis and at opposite ends of a single cylinder, spiral gear teeth cut on the outer periphery of each disc and adapted to alternately mesh with said spiral driving gear, and a slot for each interrupted disc located in each spool carrier.

4. In a machine having an inner and outer set of yarn supply packages moving in opposite directions about a common center, means for passing the yarn from the outer packages inside of the inner packages, and for driving said inner packages at all times, said means essentially comprising a separate carrier for each inner package, two substantially parallel slots moving with each carrier, a semi-circular disc rotating into and out of contact with one of said slots, a second semi-circular disc located diametrically opposite to the first disc with respect to their axis and engaging its slot while the first mentioned disc is out of contact with the carrier, each disc having an interrupted sector extending for approximately one-half its circumference, and means to rotate both discs

one half revolution while yarn from the outer package moves from slot to slot on one inner carrier.

5 In a machine having two sets of yarn supplies moving about a common cutter, means for passing the yarn from one set of
10 supplies inside of the second set of supplies and for driving said second set of supplies at all times, said means essentially comprising individual carriers for each of said second set
15 of supplies, two slots on each of said carriers, two parallel semi-circular discs connected together by a cylindrical portion and diametrically disposed with respect to their common axis, a spiral pinion having one-half of its
20 teeth on the periphery of each semi-circular disc, a driving plate adapted to carry said discs and to move about said common cutter, and a spiral gear mounted to move in a direction opposite to said driving plate and to alternately engage the teeth on the periphery of each semi-circular disc.

6. In a braiding machine, spool carrier driving means, essentially comprising a driving gear, two slots in each carrier, a pair of
25 interrupted discs diametrically disposed with respect to their axis and mounted to rotate as a unit and to alternately make and break contact each with its respective slot in said
30 carrier, and gear teeth on the periphery of each of said interrupted discs so disposed as to maintain a continuous driving of both discs by said driving gear.

7. In a braiding machine, spool carrier driving means essentially comprising a driving plate, a pair of interrupted discs diametrically disposed with respect to their axes and rotating as a unit carried by said driving
35 plate, an individual spool carrier having a separate slot for each disc, spiral gear teeth on the outer periphery of each interrupted disc, and a single spiral gear adapted to mesh with the gear teeth on each disc and to secure
40 the continuous rotation of said interrupted discs when the braiding machine is rotated.

8. In a braiding machine, spool carrier driving means essentially comprising a raceway, individual spool carriers mounted to
45 slide on said raceway, shoes attached to each carrier to slide below said raceway, two slots in each shoe, a pair of interrupted discs diametrically disposed with respect to their axes and rotating as a unit, a driving plate located below said raceway and discs and adapted to
50 carry said discs, and means for rotating each of said discs into and out of contact with its respective slot in said shoe.

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