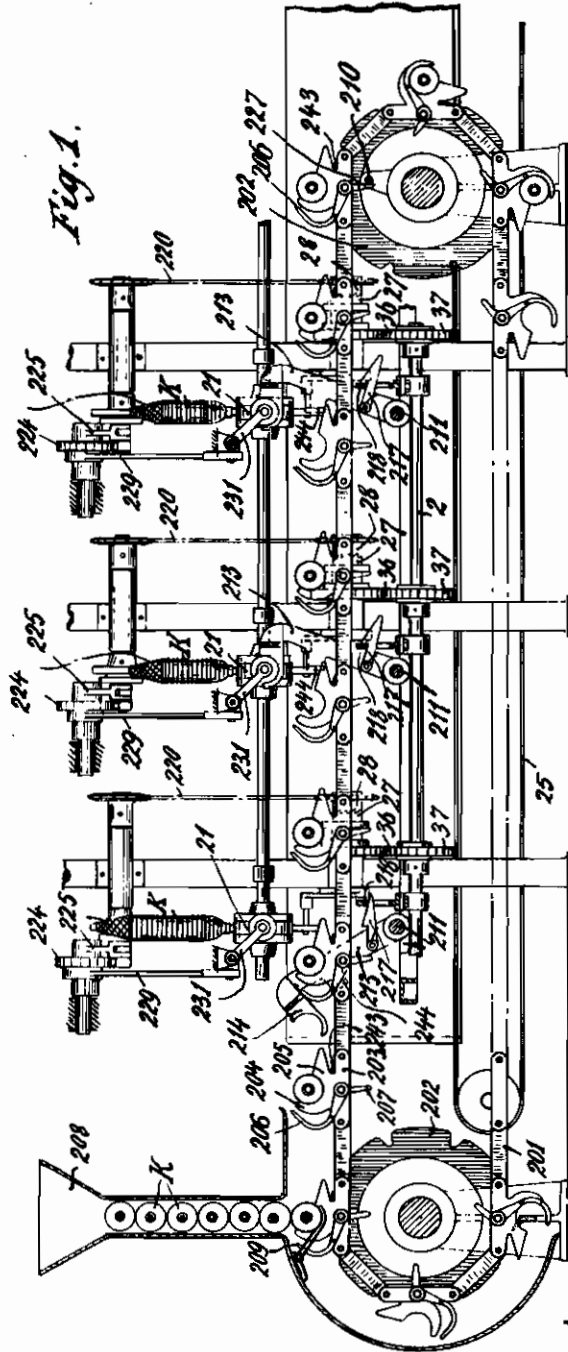


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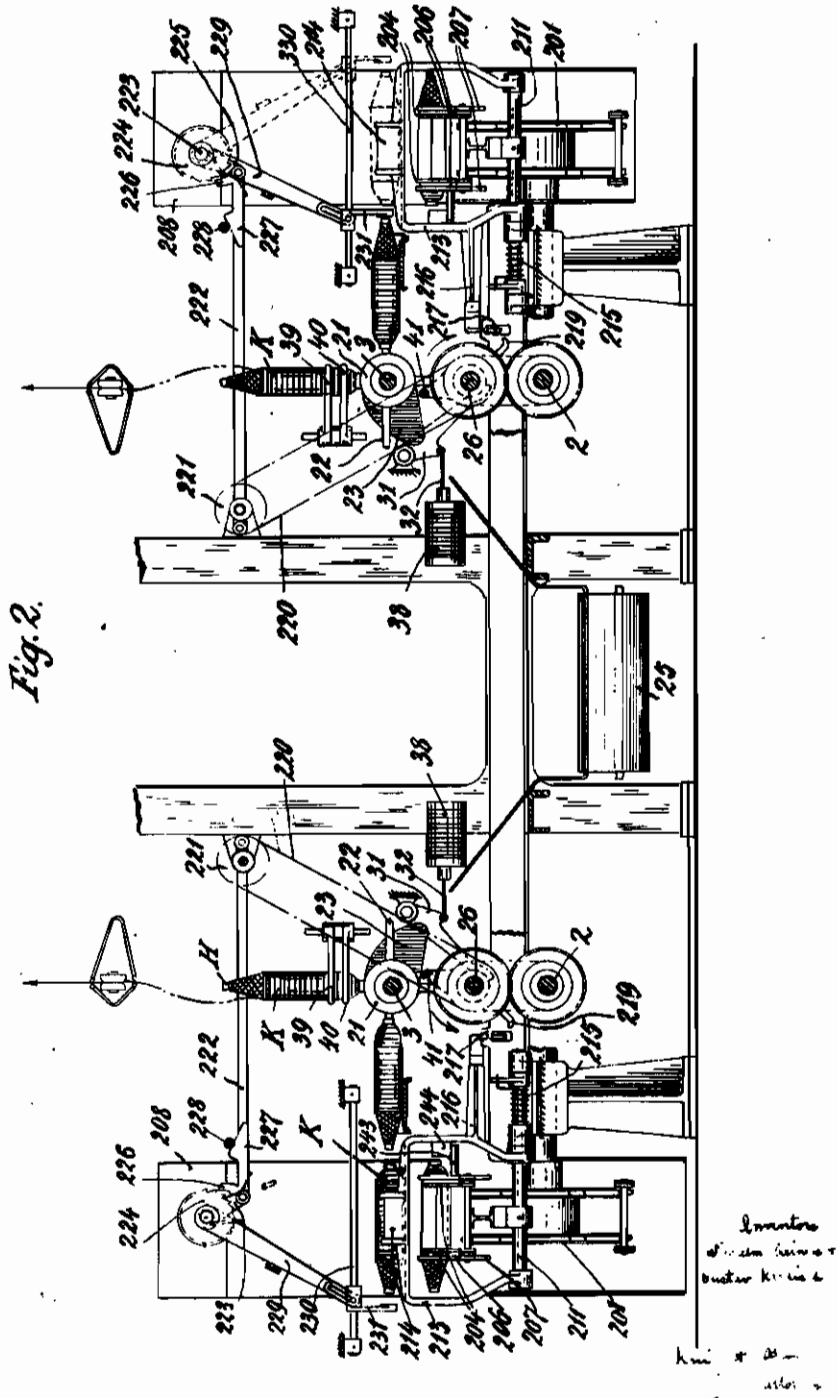


Inventors  
W. Reiners, G. Reiners and  
T. K. Reiners  
Knights, Chicago, Ill.

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BY A. P. C.

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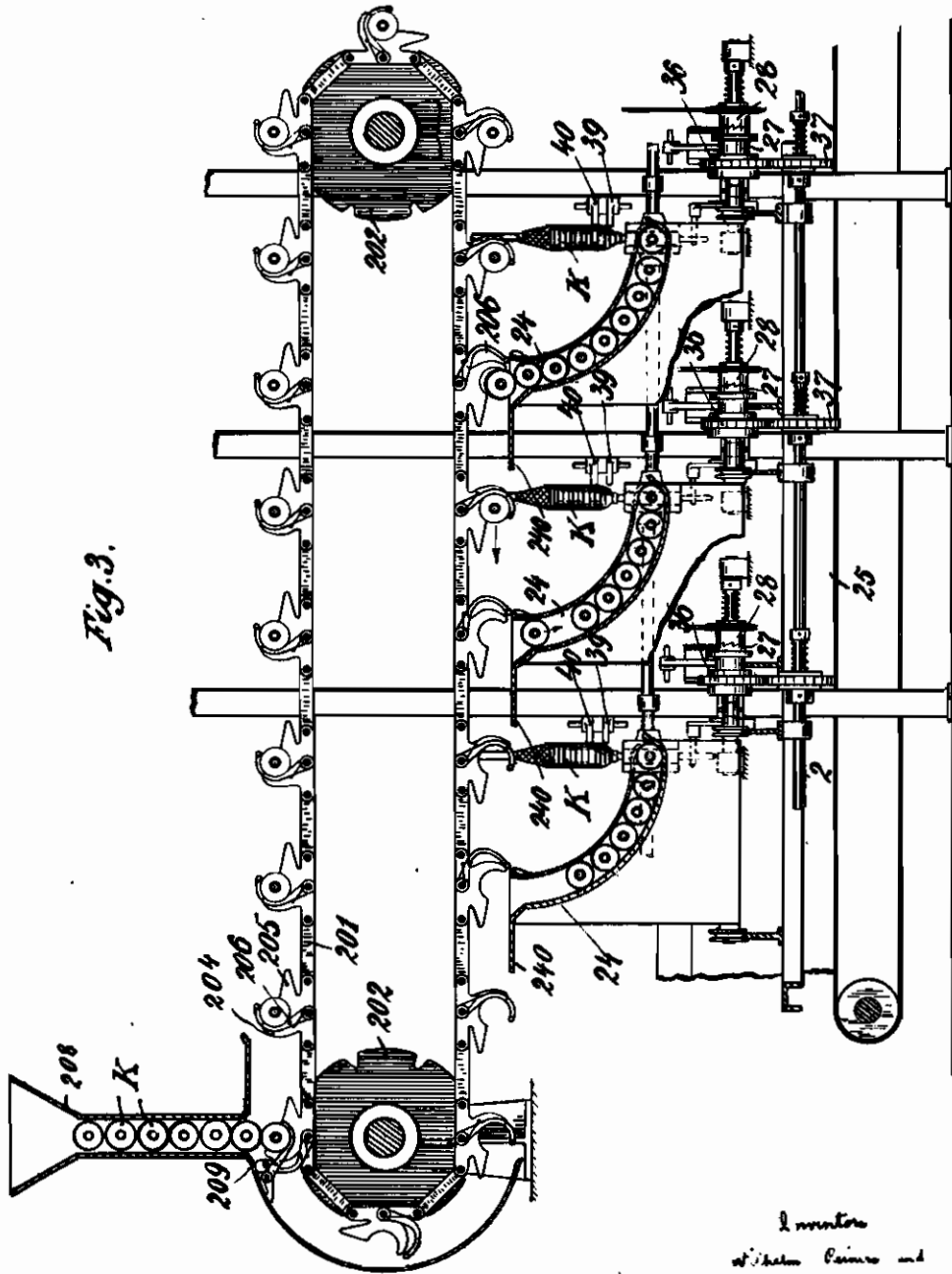


Fig. 3.

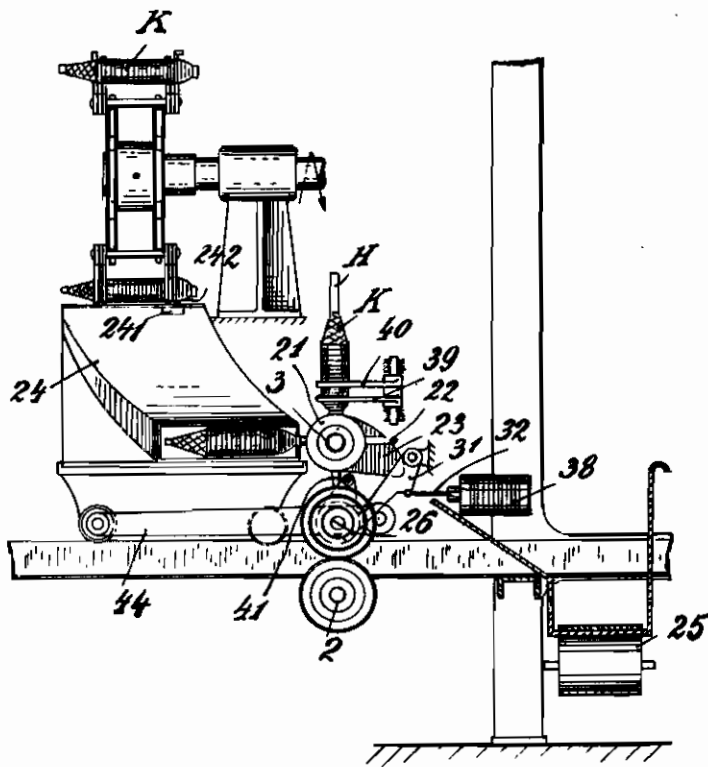
Inventors  
William Reiners and  
Walter K. Reich  
by Knight Bros  
attorneys

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Fig. 4.

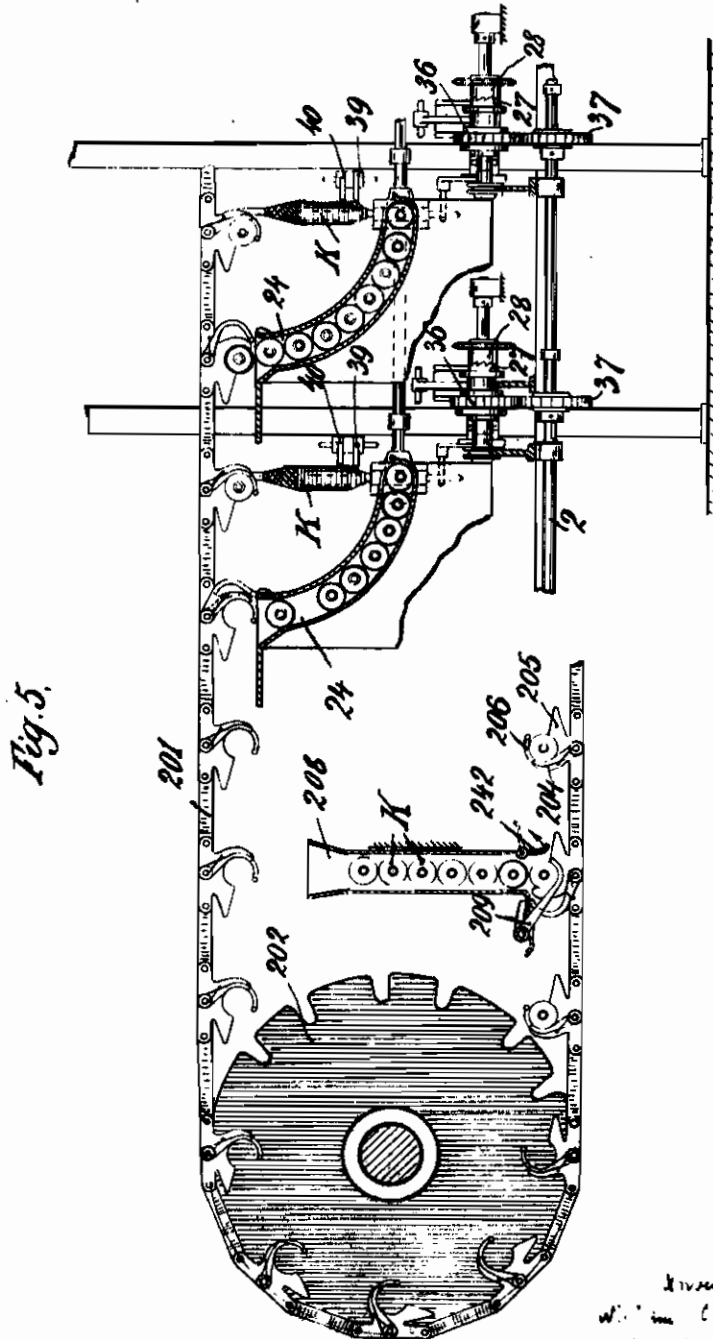


Inventors  
W. Reiners and  
G. K. K. K.  
7  
Bright B. B.  
C. C.

PUBLISHED  
JUNE 1, 1943.  
BY A. P. C.

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Inventors  
W. Reiners and  
Arthur K. Smith  
by Knight Bros.

# ALIEN PROPERTY CUSTODIAN

## CROSS WINDING FRAME

Wilhelm Reiners, Munchen-Gladbach, and Gustav Kahlisch, Rheydt, Germany; vested in the Alien Property Custodian

Application filed March 6, 1941

According to the patent application in USA, Serial No. 326,641, a cross winding frame with automatic replacing of the winding bobbins and automatic yarn connection is further developed in the direction that to each winding point a yarn knotting device and a sleeve magazine are coordinated so that at any usual spindle subdivision of the winding frame the winding work in the individual winding points can automatically progress, independent on the proceedings in the neighbouring winding points. The sleeve-magazines are arranged on carriages shiftable in the circulating plane of the rotary star, so that the actually lowermost bobbin of the magazine is pushed onto one of the mandrels of the star in the rhythm of the revolving movement of the star.

In winding machines according to this patent application in USA, Serial No. 326,641, the reserve of the winding bobbin heads is obtained thereby that the magazines are filled by hand.

In order to further simplify the attendance of the frame, the feeding of reserve is carried out according to the invention in a manner known as such by means of a common magazine and lap lattice, in that from the conveying cradles of the lattice, by means of grippers coordinated to each winding bobbin head or by means of the magazines provided according to the patent application in USA, Ser. No. 326,641 but accordingly altered, winding bobbins are automatically taken when necessary, in that the grippers during the continued running of the lattice, are oscillated from out of the range of the conveying cradles, or the locking devices holding the bobbins in their cradles are released when passing along the magazines. When grippers are employed, the bobbins are pushed by means of a pushing device from out of the gripper onto the mandrels, and bobbins not taken from the lattice are ensured against slipping out of their conveying cradles at the reversing points of the lap lattice similar as according to a former proposition. If, however, separate magazines for more than one bobbin are employed in the individual winding bobbin heads the inlet slot of each winding bobbin magazine is displaced, according to the invention, relative to the delivering point of the magazine, so that the stroke of the magazine carriage for shifting the winding bobbin on a mandrel of the rotary star remains unaltered, the rotation of the star, however takes place outside the range of the lap lattice. The invention further provides, as a separate space-saving arrangement of the lap lattice, in that the magazines of the winding bob-

bin heads and the common magazine for the automatic supplying of the lap lattice are situated within the space around which the lap lattice circulates.

Several embodiments of the invention are illustrated by way of example in the accompanying drawing. Working elements having the same effect are designated by similar reference numerals.

Figs. 1 and 2 of the drawing show the coordination of a common bobbin magazine and lap lattice for all winding points of a winding frame together with grippers holding in reserve each one a bobbin for the rotary star of each winding bobbin head in front and side elevation.

Figs. 3 and 4 show in front and side elevation the coordination of a common bobbin magazine and lap lattice for single magazines existing in the several winding bobbin heads,

Fig. 5 shows in front elevation a special construction according to Figs. 3 and 4.

At each winding point the arrangement for the replacement of bobbins is placed under the driving force of a shaft 2 in the rhythm with the change of the winding bobbins and the building up of the cross wound bobbin by means of a coupling 27, 28 and toothed wheels 36, 37, as explained in detail in the USA patent application Serial No. 326,641. When the thread reserve of the actually unwinding bobbin K is exhausted, the contact levers 39, 40 close a control current whereby through the relay 38 the rod 32 and the lever arm 31 the coupling element 28 is connected with the toothed wheel 36 by means of a coupling bolt. The rotary star 21 is then turned by revolution of shaft 26 by a pin 41 striking against the lowermost star mandrel 22, whereby the foot of the empty sleeve H (Fig. 4) is shifted by the stationary stripper 23 from its mandrel 22 and the lap lattice 25 is thrown out.

In the example shown in Figs. 1 and 2 a lap lattice 201 circulates in front of the winding bobbin heads over driving and guiding wheels 202. Every second chain link 203 is constructed double to form a conveying cradle 204 which carries forwardly directed noses 205 on the end which is the front end in the running direction. Each conveying cradle 204 is further equipped with locking levers the upper parts 206 of which engage over the inserted bobbin as soon as the lower arm 207, when running into the reversing point of the lap lattice 201 at the right hand shown in the example in Fig. 1, strikes against a pin 210. If an empty cradle 204 of the lap lattice 201 moves under the magazine 208 the actually lowermost bobbin K, prevented by tongues 209

from slipping out, is pushed out by the noses 205 in the cavity, whereas when the cradle is still filled the content of the magazine is correspondingly pressed upwards and thereby liberates the path. The next bobbin K not carried along slides over the rounded rear wall of the cradle down onto the tongues 209. In front of each winding bobbin head a bobbin gripper 214 is arranged in arms 213 pivotable about a shaft 211, said bobbin gripper being pressed by a spring 215 into the path of the lap lattice 201 as soon as a locking nose 217 fixed on an arm 216 is liberated by a pin 218 under the action of a stop 219 controlled at the bobbin changing. The conveying cradle 204 therefore hands over its bobbin, when the movement continues, to the downwardly oscillated gripper 214 and then presses the same upwards by means of the noses 243, 244, so that the locking lever 217, 218 engages. The bobbin is thus brought into the axis of the mandrels 22 directed in the example shown in Fig. 2 towards the left or towards the right. A ratchet wheel 224 is then rotated through the intermediary of a chain drive 220, a crank 221 and a rod 222, also influenced by the shaft 26, by the control nose 228 hinged on the lever 225, said ratchet wheel turning about a shaft 223, said control nose 226 up to the moment having been held out of engagement with the ratchet wheel 224 by the inclined surface 227 and the pin 228. At the rotation a long arm 229 is moved in opposition to the action of a spring towards the winding bobbin head and thereby the reserve bobbin is shifted onto the mandrel 22 of the star by means of a stop 231 guided on a rod 230 as shown in Fig. 2 on the left hand half.

In the embodiment illustrated in Figs. 3 to 5

the pushing on of the reserve bobbin is effected as according to the USA patent application, Serial No. 326,641 by the magazine carriage carrying the magazine 24 and moved by a crank drive on the control rod 44.

The inlet slot of each magazine 24 is displaced relative to the pushing out opening so much, that it is run-over by the conveying cradles 204, but not displaced farther from the winding bobbin head than the free circulating of the rotary star requires at the putting on of a reserve bobbin. The bobbins are securely held in this form of construction also in the straight portion of the path along which the lap lattice moves. When passing along the magazines 24 the locking arms 206 are oscillated back against the action of the springs acting on them so that the bobbin can sink into the magazine 24 as long as the magazine is not completely filled. When the magazine is filled, however, the bobbin continues to roll and gets onto a guide plate 240 mounted on the guide slot which guide plate presses the bobbin again into the conveying cradle until the locking arms grip over it again. In the edge of a magazine an indentation 241 may be provided and also a small transverse bar 242 as shown in Fig. 4 which enables the closing position of the locking arms 206 as long as a magazine is not exactly within the range of the conveying cradle owing to the shifting-on movement.

The special construction shown in Fig. 5 shows the space-saving arrangement of all single magazines 24 and of the main magazine 208 in the space around which the lap lattice circulates.

WILHELM REINERS.  
GUSTAV KAHLISCH.