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E. R. AMMON

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FLAT HOSIERY KNITTING MACHINE AND MARKING ATTACHMENT THEREFOR

Filed Nov. 22, 1944

3 Sheets-Sheet 1

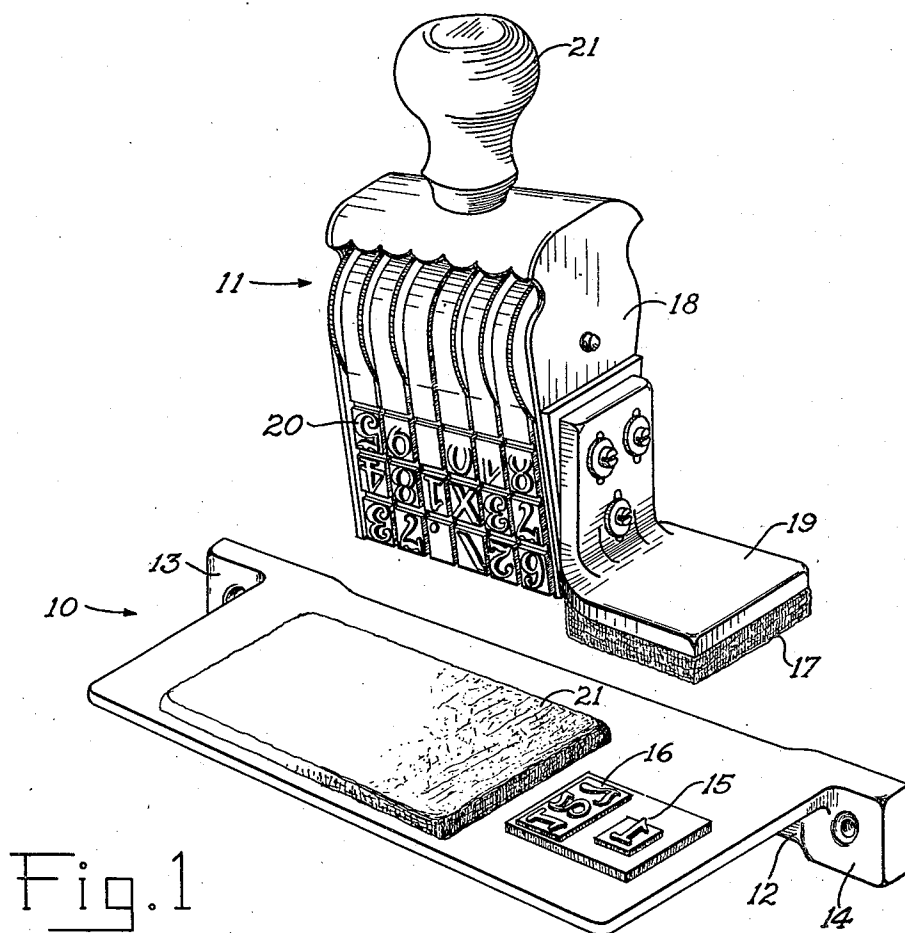


Fig. 1

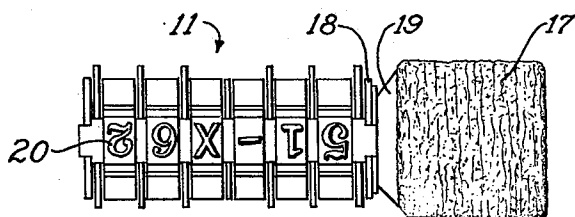


Fig. 2

Inventor
EDWARD R. AMMON

By *Perry + Miller*
Attorney

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3 Sheets-Sheet 2

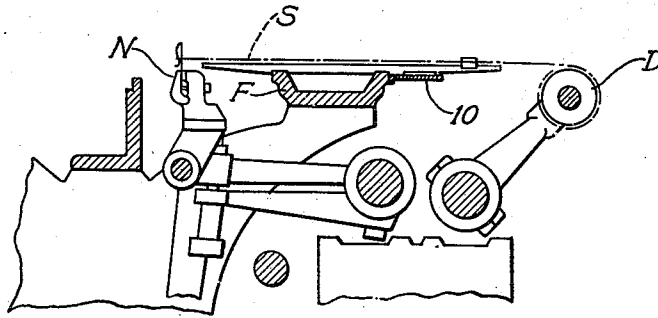


Fig. 3

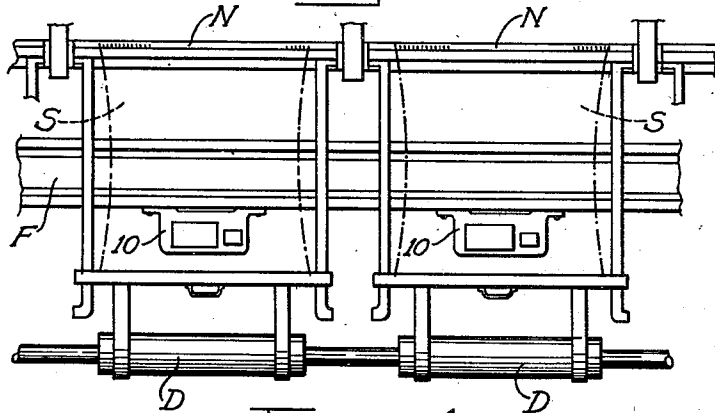


Fig. 4

Inventor

EDWARD R. AMMON

By

Parry & Miller

Attorney

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3 Sheets-Sheet 3

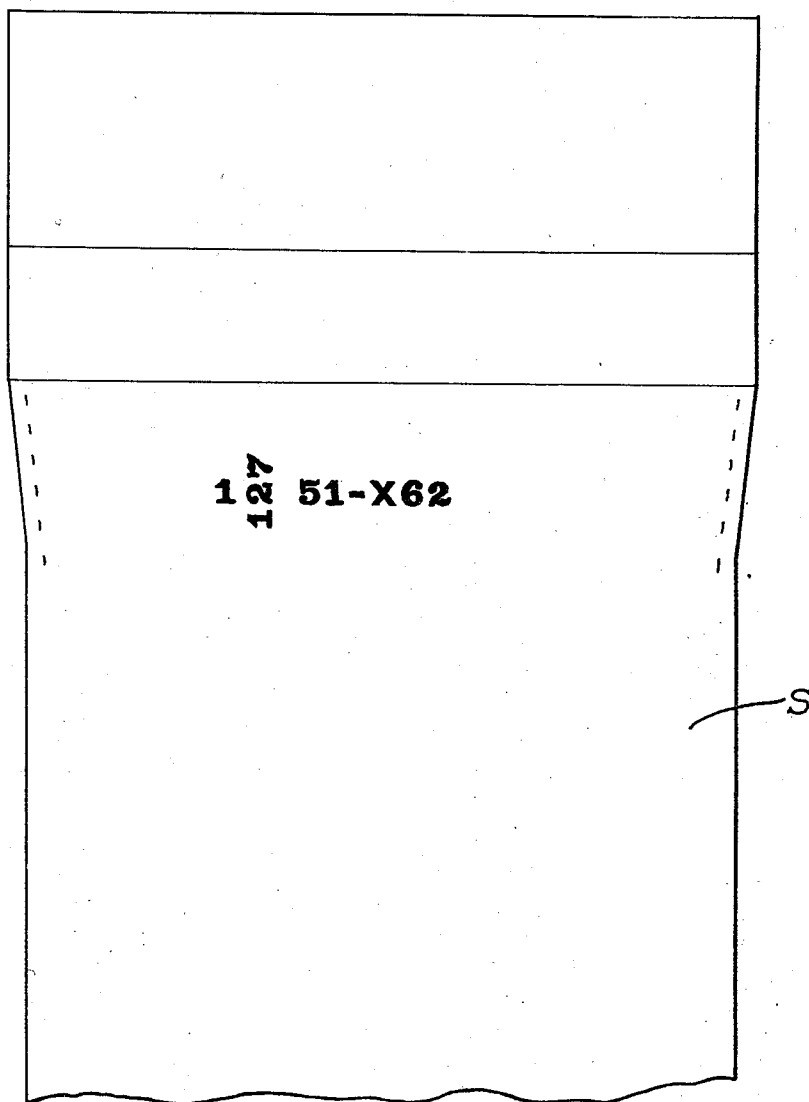


Fig. 5

Inventor

EDWARD R. AMMON

By

Parry & Miller

Attorney

UNITED STATES PATENT OFFICE

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FLAT HOSIERY KNITTING MACHINE AND
MARKING ATTACHMENT THEREFOR

Edward R. Ammon, Reading, Pa.

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17 Claims. (Cl. 101—333)

This invention relates to the marking of knitted articles, particularly stockings, during knitting on flat knitting machines with identifying information, and is directed to improved mechanism for such purpose which may be supplied as original equipment on flat knitting machines or marketed separately as an attachment which may be readily installed on such machines.

While being useful in conjunction with flat knitting machines knitting blanks for various types of articles, the invention is primarily important in conjunction with multi-section full-fashioned hosiery machines, and can best be understood by considering the same in such use.

It is a desirable and common practice in hosiery mills to mark and/or attach labels to stockings in the knitting department so that before and after stockings leave such department one or more points of information about them will be available. Where defective stockings are produced, the defects sometimes will be discovered before the stocking blanks leave the knitting machines, while in other instances the defects may not become apparent until the stockings have reached the seaming, looping or inspection departments. Regardless of when the defects are discovered it is important to know upon what machine and particular machine section the stocking was knit so that it can be determined whether the defect arose from faulty operation of some part of the machine, or due to the fault of the machine operator so that corrective measures may be taken. Again, since different knitting machines may simultaneously knit stockings of different style, size and gauge, and of different yarns, it is desirable that information on one or more of these points be available so that stockings of different characteristics can be maintained in separate lots against accidental mixing in or during transportation between different departments.

The only reliable way of providing machine information and stocking characteristic information, and at the same time eliminate, or at least minimize the necessity of tagging stockings, is to mark the stocking blanks before they leave the sections of the knitting machines. It is a general object of the invention to accomplish this purpose.

So far as I am aware no commercially acceptable mechanism for marking stockings before they leave the knitting machine has been developed, although prior efforts have been made. Whatever its structural nature the marking mechanism must be capable of marking each stocking

with information identifying which of the 12, 16, 20 or 24 sections of a conventional flat knitting machine they are knit upon. This entails the provision of different marking indicia for each machine section. To further identify stockings as to the different machines upon which they are knit, the knitter and/or stocking characteristics such as size, etc., special additional parts must be provided in the marking mechanism. Aside from capabilities of performance, the nature of the marking mechanism must be such that it can be so located as not to interfere with operation of the knitting machine, or obstruct the hands of the knitter in operations he must perform during the knitting operation or in making adjustments and repairs. These various factors have been kept in mind in the development of the present invention, and it has been found by actual test that the invention satisfies all requirements as well as being relatively simple in construction, economical in cost and capable of easy operation without delaying the knitting operation or demanding any substantial effort from the knitter.

Generally described, the marking mechanism of the invention comprises a series of stationary units, one for each article knitting section of a flat knitting machine, and a coacting portable unit adapted to be moved from one to another machine section for successive article marking operation in cooperation with the units of the stationary series. Identifying information is applied to the articles by stamping numbers and/or symbols in appropriate marking ink through appropriate printing type and ink supply means. For certain purposes printing type elements will be carried by the portable unit and each of the stationary units will include ink supply means for coaction with the type of the portable unit as it is advanced from one to another knitting section of the machine. For other purposes, each of the stationary units will mount printing type and an ink supply means will be carried by the portable unit for cooperation with the type of each of the stationary units. To obtain full utility of the invention, as will hereafter become apparent, it is preferred to provide printing elements and ink supply means on both the portable and stationary units so that marks may be applied to the article simultaneously by printing elements on a stationary unit in coaction with ink supply means on the portable unit while further marks are applied to the article by printing elements on the portable unit in coaction with ink supply means on the stationary unit.

The nature of the identifying information to be marked on the articles will largely determine when printing type to produce the same should be mounted on the portable unit and when on the series of stationary units. For marking stockings knit on different sections of the same machine with different symbols, such as symbols identifying the machine section upon which each article is knit, it is desirable to provide printing elements on the stationary units, since if printing elements for the purpose were located on the portable unit a changeable series of such elements would be necessary on the portable unit which would have to be changed either manually or mechanically between marking operations at successive machine sections and mistakes in marking might occur. For marking the stockings with identifying information which is the same for articles knit on all sections of a machine, the printing elements in some cases will desirably be located on the portable unit and the same printing elements will mark the articles at each machine section while in other cases similar printing elements will be located on each stationary unit and the articles at different machine sections will be marked by different rather than the same printing type. Thus, markings indicating the number of a machine knitting a set of articles could be produced by type mounted on the portable unit, since no change in type would be required between printing operations at successive sections of a machine, but it is preferred to locate similar printing type for this purpose on the individual stationary units so that the same portable unit may be used in conjunction with two or more separate knitting machines in the interest of economy, and there will be greater assurance that articles will be marked with the correct machine number. On the other hand, markings identifying stocking characteristics, such as stocking style and size which will be the same for all articles knit on any one or more machines at one period of operation but which would require change at another period of operation on the same machine if the adjustment of the machine were changed to knit articles of different specifications, are desirably produced by printing type on the portable unit under a construction of such unit which permits the printing elements to be readily changed according to requirements. Information as to a particular knitter operating a machine will desirably also be marked by printing elements on the portable unit, since usually different knitters on different shifts will operate the same machine. Markings indicating the gauge of article fabric can be produced by printing elements located on the stationary units, since this is determined by the number of needles in the needle bar and each machine always knits the same gauge of fabric, but in some cases the type for this purpose may be located on the portable unit to be used or not as desired.

It will be understood that the number of markings and the location of printing elements is variable to meet different conditions, and the examples just given are merely to be taken as illustrative of the capabilities and preferred operation of marking mechanism embodying a series of stationary units and a coacting portable unit.

The invention will be understood by reference to the illustrative embodiments shown in the accompanying drawings and the description to follow.

In such drawings:

Fig. 1 is a perspective assembly view of two of the coacting units of my marking mechanism;

Fig. 2 is a bottom plan view of the upper unit shown in Fig. 1;

Fig. 3 is a fragmentary transverse section of a section of a flat knitting machine with the lower unit of the present marking mechanism shown in Fig. 1 installed therein;

Fig. 4 is a fragmentary top plan view, more or less diagrammatic, of two adjoining sections of a flat knitting machine with units of the present marking mechanism applied to each; and,

Fig. 5 is a diagrammatic plan view of a portion of a stocking blank with identifying markings thereon produced through the present mechanism.

In the embodiment illustrated in the drawings, there are a series of stationary units 10 for each machine section and a portable coacting unit 11. The lower units take the form of a rigid platen-like member of metal or other suitable material having means such as supporting flange 12 with apertured extensions or wings 13 and 14 at its opposite ends for mounting, as by means of securing screws or bolts, respective units on a suitable supporting part of the knitting machine frame in the different knitting sections of the machine. The number of stationary units 10 will be determined by the number of sections in the knitting machine. Thus, in a twenty-four hosiery knitting machine there will be twenty-four units 10, one secured in each section. As shown in Figs. 3 and 4 units 10 can be conveniently mounted on horizontal frame member F which extends lengthwise through all sections of the machine in a position intermediate the needle bars N and fabric draw-off reels D. By so mounting stationary units 10, or utilizing any equivalent point of support in the machine, units 10 are positioned beneath and adjacent the path of delivery of stocking blanks S. By so locating the units it will be apparent that they will not in any way interfere with the knitting operation or obstruct the hands of the knitter.

A single portable unit 11 is used and moved from one to another machine section so that no permanent parts of the marking mechanism need be mounted at the various machine sections above the path of delivery of the stockings where it would interfere with machine operation. The marking operation may be carried out at any time after a set of stocking blanks, or other article blanks, have been knit to a length such that their initially knit ends have advanced beyond stationary units 10. The knitter, carrying portable unit 11, which is equipped with a suitable handle 21, starts at one end of the machine, starting with section 1, and brings the portable unit into registering position with each machine section stationary unit 10 and moves the portable unit downwardly to press and mark the stocking fabric between them. In conventional flat knitting machines the stocking blanks are delivered in a horizontal direction, and the stationary units and the portable unit may be respectively designated as the lower and upper units.

Mounted on each of the lower units are printing elements 15 and 16. Elements 15 are intended to mark the stocking blanks with the numerals or equivalent symbols identifying the particular section of the machine upon which each is knit. Accordingly, elements 15 on units 10 of the different machine sections will comprise different printing characters such as 1, 2, 3, 4, etc. Printing elements 16 are intended to mark the stocking blanks each with the same number or other symbol identifying the particular machine upon

which they are knit. Accordingly, the printing characters of elements 16 on all the stationary units 10 of one knitting machine will be the same. It is apparent that both elements 15 and 16 are desirable so that stockings may be marked with indicia which will enable stockings from different machines to be identified both as to the machine and section upon which they were produced.

Marking ink for coaction with elements 15 and 16 of each of the stationary machine section units 10 is supplied by an ink bed 17 of felt or other absorbent material carried by portable unit 11. Unit 11 is here shown as comprising a conventional form of large changeable type rubber stamp having a frame 18. Ink bed 17 is attached to an angular supporting plate 19 secured to the side of frame 18.

While in some cases the portable unit 11 may not itself include printing indicia and take a form different from that illustrated, it is preferable that the same should include one or more printing elements 20 as certain types of identifying information can be more conveniently printed in this manner than through printing indicia mounted on the stationary units. Printing elements 20 here take the form of a series of endless bands each containing a series of printing characters which may be selectively brought to printing position at the underside of unit 11 as seen in Fig. 2. Six printing elements 20 are provided in the unit shown, but of course a greater or lesser number may be used, all depending on how many different points of information are desired to be marked on the stocking blanks. By way of illustration, two of the printing elements 20 are set to print the numeral "51," which could represent the gauge of the stocking fabric. A third printing element is set to print the letter "X," which might indicate the style of the stocking. Two other elements are set to print the number "62," which might identify the particular knitter.

An ink bed 21 is provided on each of machine section stationary units 10 for coaction with the printing elements of the portable unit 11. By reference to Fig. 1 it will be evident that printing elements 20 and ink bed 17 of portable unit 11 are arranged to effect simultaneous printing operations with respective ink beds 21 and printing characters 15 and 16 of each of the machine units 10.

By reference to Fig. 4 in conjunction with Fig. 5, it will be apparent that any one or more points of information may be printed on the knitted stocking blanks S during the course of knitting. Where, as preferred, printing elements are provided on both the portable and series of stationary machine section units 11 and 10, some of the markings will be applied to one side of the stocking blank, and other markings applied to the reverse side. With the printing indicia here arbitrarily illustrated the characters 51—X—62 will be printed on one side of the blank through the printing elements on the portable unit 11 and the characters 1 and 127 will be printed on the opposite side by printing elements carried by stationary units 10. While portable unit 11 has been shown as having changeable printing indicia, it will be understood that no adjustment thereof is required between successive printing operations, since the same markings will be applied thereby to the stockings knit on all sections of one machine, and the only time the printing characters on unit 11 will be changed will be when the machine is changed to knit stockings of different

specifications or a different knitter is operating the machine.

The characters 1 and 127 printed on the reverse side of the stocking blank in Fig. 5 and designating the machine and section can be produced from fixed type since they will always be the same for any one machine regardless of the specifications of the stocking being knit and the identity of the knitter, and they can be economically mounted on each of the series of stationary units 10 with the advantage that such arrangement insures against marking the stocking blanks accidentally with either the wrong machine or section identifying symbols. It will be understood, of course, that whereas the machine identification symbol, here 127, will be the same on stockings knit on all sections of one machine, the section identifying symbol, here 1, will be different on the stockings knit on successive machine sections.

Where, as preferred, characters are applied to both sides of the fabric, it is nevertheless desirable that they be capable of reading together from one side of the fabric. This is made possible because the ink penetrates through the fabric. To read correctly, the printing type at one side of the fabric will as conventionally be formed with the type characters in mirror reverse form so as to print correct characters as seen from that side, whereas the printing type at the second side of the fabric will be in correct form to print mirror characters seen in mirror reverse from the second side of the fabric but in correct form as seen with the first characters from the first side of the fabric.

Thus Figure 5 represents the outside of a stocking which is at the bottom as the fabric comes from the knitting machine as seen in Fig. 3. Bottom type characters 15 and 16 are mirror reverse characters to print correct characters 1 and 127 on the fabric outer side from ink penetrating through the fabric from pad 17. Upper type characters 20 are in correct form (though seen vertically inverted in Fig. 2) to print 51—X—62 in ink from pad 21 which appear as reverse characters as seen from the inside of the fabric but which like the type characters 20 are in correct form as viewed from the outside of the fabric.

Under most circumstances the information marked on the stocking through the present printing mechanism will serve only during various stages of the manufacturing process. Accordingly, the markings can be made in relatively large characters, and in non-permanent ink which will be soluble to eliminate the markings when the stockings are dyed. Thus, markings identifying the machine and section become of no importance once the stockings have been looped, seamed and inspected. It is possible, however, through the use of the printing mechanism and the employment of permanent ink to provide permanent markings on the stockings, for example, size and/or gauge.

It will be evident to those skilled in the art that the portable and stationary units of my marking mechanism may be constructed in a variety of different forms and that the particular construction of such units here illustrated and described is merely illustrative. Accordingly, the scope of the invention is to be judged from the appended claims.

I claim:

1. In a multi-section flat knitting machine, printing mechanism for marking article blanks in the course of knitting with identifying infor-

mation comprising printing means mounted in each machine section on one side of the path of article blank delivery intermediate the knitting mechanism and fabric draw-off mechanism for engagement with one side of the article blanks and having printing indicia for marking the article blanks with certain identifying information, and portable printing means movable from one to another machine section and operable in conjunction with the printing means mounted in each machine section, said portable printing means having printing indicia for marking the article blanks with other identifying information.

2. In a multi-section flat knitting machine having printing mechanism for marking article blanks with identifying information according to claim 1 wherein there are different printing indicia on the printing means mounted in the different machine sections for marking the article blanks knit on the various sections with distinguishing information, and wherein common printing indicia is provided on the portable printing means for similarly marking the article blanks at all sections with identifying information common to all the article blanks.

3. In a multi-section knitting machine having printing mechanism for marking article blanks with identifying information according to claim 1, wherein the printing means mounted in the different machine sections have fixed printing indicia and the portable printing means has changeable printing indicia.

4. In a multi-section flat knitting machine, printing mechanism for marking article blanks in the course of knitting with identifying information comprising a series of first units mounted one in each machine section on one side of the path of article blank delivery intermediate the knitting mechanism and fabric draw-off mechanism for engagement with one side of the article blanks, a portable second unit adapted to engage the other side of the article blanks and movable from one to another machine unit for successive cooperative article marking operation with each of the first units, printing indicia on each of the first units and second unit, and article supporting bed means on each of the first units and second unit.

5. In a multi-section flat knitting machine, printing mechanism for marking article blanks in the course of knitting with identifying information comprising a series of fixed units mounted one in each machine section beneath and adjacent the path of article blank delivery from the needle bar, a portable unit adapted to be moved from one to another machine section above the article blanks for successive cooperative article marking operation with the fixed units at all machine sections, different printing indicia means on each fixed unit adapted to mark the article blanks with distinguishing information identifying the machine section knitting each article blank, a common ink bed on the portable unit adapted to cooperate with the printing indicia means on each of the fixed units, printing indicia means on the portable unit adapted to mark the article blanks with similar identifying information common to the article blanks knit on all machine sections, and individual inking beds on the fixed units at all machine sections adapted to cooperate with the printing indicia means on the portable upper unit.

6. In a multi-section flat knitting machine, printing mechanism for marking article blanks

in the course of knitting with identifying information comprising means mounted in each machine section intermediate the knitting mechanism and fabric draw-off mechanism beneath and adjacent the path of article blank delivery adapted to engage and support the article blank at their underside during a printing operation, portable means adapted to be moved from one to another machine section to successively engage the upper side of the article blanks at each machine section and press them into engagement with the underneath article supporting means mounted in such section, and printing means carried by at least one of said portable means and said machine section mounted means.

7. In a multi-section flat knitting machine, printing mechanism for marking article blanks in the course of knitting with identifying information comprising a series of first units mounted one in each machine section on one side of the path of article blank delivery intermediate the knitting mechanism and fabric draw off mechanism for engagement with one side of the article blanks, a portable second unit adapted to engage the other side of the article blanks and movable from one to another machine unit for successive cooperative article marking operation with each of the first units, printing indicia means on the unit on one side of the path of article blank delivery, and coacting article blank supporting bed means on the unit on the opposite side of the path of article delivery.

8. In a multi-section flat knitting machine, printing mechanism for marking article blanks in the course of knitting with identifying information comprising a series of first units mounted one in each machine section on one side of the path of article blank delivery intermediate the knitting mechanism and fabric draw-off mechanism for engagement with one side of the article blanks, a portable second unit adapted to engage the other side of the article blanks and movable from one to another machine unit for successive cooperative article marking operation with each of the first units, printing indicia on the second unit, and coacting article blank supporting bed means on each of the first units.

9. In a multi-section flat knitting machine, printing mechanism for marking article blanks in the course of knitting with identifying information comprising a series of first units mounted one in each machine section on one side of the path of article blank delivery intermediate the knitting mechanism and fabric draw-off mechanism for engagement with one side of the article blanks, a portable second unit adapted to engage the other side of the article blanks and movable from one to another machine unit for successive cooperative article marking operation with each of the first units, a series of different printing indicia mounted one on each of the first units, and coacting article blank supporting bed means on the second unit.

10. An article marking attachment for a multi-section flat knitting machine comprising a series of units adapted to be mounted one in each section of a flat knitting machine adjacent one side of the path of article blank delivery from the knitting mechanism, a portable unit adapted to be moved from one to another machine section for successive cooperative article blank marking operation with each of the series of machine section units, printing indicia means on each machine section unit for marking the article blanks with information identifying the machine

and machine section upon which each article blank is knit, common article supporting and ink bed means on the portable unit adapted to cooperate with the printing indicia means on each machine section unit, further printing indicia means on the portable unit adapted to mark the article blanks with similar identifying information common to the article blanks knit on all machine sections, and individual article supporting and ink bed means on each of the machine section units adapted to cooperate with said printing indicia means on the portable unit.

11. An article marking attachment for a multi-section flat knitting machine comprising a series of similar members adapted to be mounted one in each section of a flat knitting machine beneath and adjacent the path of article blank delivery from the knitting mechanism to the fabric draw-off mechanism, fixed printing indicia on the upper side of each of said members with the indicia on one member being different from the indicia on each other member, ink pads on each of said members in side by side relation with said printing indicia, a portable unit adapted to be moved from one to another machine section mounting an inverted ink pad and downwardly facing printing indicia in side by side relation for cooperative printing operation with the printing indicia and ink pad of each member of said series.

12. A stocking marking attachment for a multi-section flat hosiery knitting machine comprising a portable stamp adapted to be moved from one to another section of a flat knitting machine, said stamp having changeable indicia adapted to be initially set to mark the stocking blanks being knit on all machine sections with similar identifying information, such as stocking style, stocking gauge, yarn size and machine operator, a series of units adapted to be mounted one in each knitting machine section beneath the path of stocking blank delivery from the knitting mechanism and each including article supporting and ink bed means for cooperation with the portable stamp, and further cooperative printing means for marking the article blanks knit on each machine section with distinguishing information, such as the particular machine section number upon which each stocking blank is knit, said additional printing means including individual stamps comprising different printing indicia mounted on each machine section unit, and common inverted article supporting and ink bed means secured to the portable stamp for cooperative stocking blank marking operation with the printing indicia means on each machine section unit simultaneously with stocking blank printing operation of the portable stamp and inking beds of machine section units.

13. An article marking attachment for a multi-section flat knitting machine comprising a series of similar stationary bed plates adapted to be mounted one in each section of a flat knitting machine beneath and adjacent the path of article blank delivery from the knitting mechanism to the fabric draw-off mechanism to support the article blanks during a marking operation, a portable hand printing stamp adapted to be moved from one to another machine section having printing indicia adapted to successively mark each article blank with similar identifying information in cooperation with said series of bed plates, and ink supply means coactive with said stamp.

14. An article marking attachment for a multi-section flat knitting machine comprising a series of stationary units adapted to be mounted one in each section of a flat knitting machine adjacent one side of the path of article blank delivery from the knitting mechanism, an ink pad mounted on each of said hand stamped units, and a portable unit adapted to be moved from one to another machine section and mounting printing indicia means adapted to successive cooperative article blank marking operation with the ink bed means of each of the series of machine section units.

15. An article marking attachment for a multi-section flat knitting machine comprising a series of stationary units adapted to be mounted one at each section of a flat hosiery knitting machine adjacent one side of the path of article blank delivery from the knitting mechanism, different printing indicia means mounted on each unit for marking the article blanks knit on different machine sections with distinguishing information, and a portable article blank supporting unit adapted to be moved from one to another machine section mounting inking means for successive cooperative marking operation with the printing indicia means on each of the series of machine section units.

16. In a multi-section flat knitting machine having printing mechanism according to claim 4 wherein the printing indicia at one side of the fabric are in mirror reverse form and the printing indicia at the other side of the fabric are in correct form so that the markings printed by both indicia will be in correct form as viewed from the same side of the fabric.

17. An article marking attachment for a multi-section flat knitting machine according to claim 10 wherein the printing indicia on the machine section and portable units are in reverse form relative to each other so that the markings printed by all indicia will be in correct form as viewed from the same side of the fabric.

EDWARD R. AMMON.