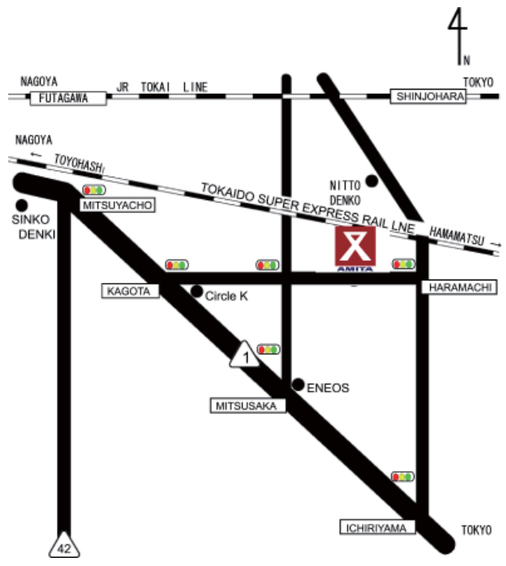
Bobbin capacity (inmeters)

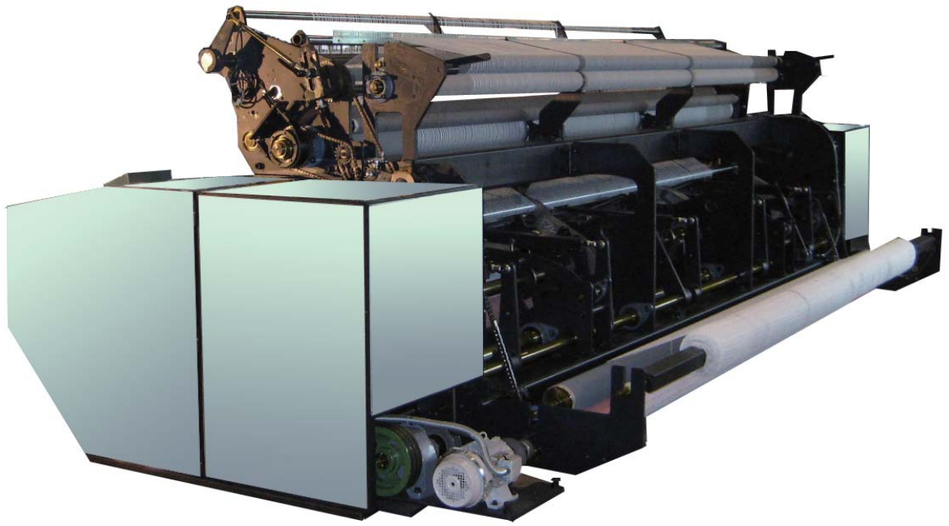
Type	9mm	11mm	14mm	18mm
(Bobbin dia.)	(230mm)	(230mm)	(250mm)	(250mm)
Grams	118g	145g	220g	280g
0.6(0.125)				
0.8(0.147)				
1(0.162)				
1.5(0.202)	3,221			
2(0.234)	2,419			
3(0.284)	1,605	1,980		
4(0.329)	1,204	1,480		
5(0.368)	967	1,186	1,720	1,783
6(0.403)		988	1,432	130
7(0.472)		740	1,070	1,063
8(0.472)			860	886
10(0.522)			716	760
12(0.571)			614	665
14(0.616)			536	590
16(0.656)			470	530
18(0.696)				483
20(0.736)				443
22(0.772)				409
24(0.806)				379
28(0.871)				354
30(0.903)				265
40(1.045)				
1.5" 4		690		1,320
1.5" 5		595		1,140
1.5" 6			590	910
1.5" 8				600
1.5" 12				360
1.5" 16				304
1.5" 30				152

Note: 1) The above date is for nylon monofilament.
2) Table date units reflect meters.
3) Lengths caluculated from loading capacity in grams, individual resulsts may vary.



For further information on Amita products and service, please contact the manufacturer directly at the following address:
AMITA COMPANY 1-3 Hara-machi, Toyohashi, Aichi 441-3111, Japan
Telephone: 81-532-65-2222 Facsimile: 81-532-65-2220 Email: sales@gta.amita.co.jp

High Speed
Net Machines
Up to 24 RPM !



Model:MSA 14-30

MODEL NEW MSA
Completely re-designed

January 2017

Introducing our 2017 year Project

Local Assembly New Model MSA

14 Totally new MSA types

The new MSA series Line for Local Assembly from 9-50L to 18-25 Nylon monofilament/multifilament and Polyethylene twine.

Amita Proudly presents its latest state of the art technology for the 21st century.

Designing Concept

Mr. A. Murata

Mr. Y. Amma

Mr. T. Suzuki

In designing New Local Assembly Model MSA, we made an importance in the following points:-

1) Design suited for Local Assembling
2) High precise parts
3) High rigidity and Long durability
4) High speed then the stability of machine with high quality
5) Easy adjustments
6) High percentage of interchangeable parts between different type of machines
7) Design to be able to cope with future demand
   a) Automatic and labor saving
   b) Special knots
   c) Rollers formation to be extended to be cope with thicker and higher number of selvages
   d) Monitoring system

We sincerely hope that you will appreciate for our newly designed Model MSA.

MODEL MSA Specifications

Pitch	MSA9-50	MSA10.5-40S	MSA11-40	MSA11-40L
Number of shuttles	512	412	412	412
Diameter of bobbin	230mm	250mm	230mm	250mm
Applicable twine range				
Nylon Mono (Bobbin capa)	0.20～0.40		0.28～0.50 (145g)	0.28～0.50 (175g)
Nylon Multi (Bobbin capa)	210/4～210/18	210/6～210/36 (126g)	210/6～210/27 (106g)	210/6～210/27 (128g)
PE twine (Bobbin capa)	250/3～380/9	380/3～380/15 (105g)	380/3～380/15 (88g)	380/3～380/15 (106g)
PE Braided		-	-	-
Mesh range (knot to knot)	7.5mm～150mm	8.5mm～150mm	8.5mm～150mm	8.5mm～150mm
Looming speed	24RPM	24RPM	24RPM	23RPM
Knot configuration	SINGLE/DOUBLE	SINGLE	SINGLE/DOUBLE	SINGLE/DOUBLE
Type of upper hook		Plate type		
Main motor	3.7kw＊1	3.7kw＊1	3.7kw＊1	3.7kw＊1
Mesh forwarding motor				
Dimensions	6,680*2,280*1,740	6,680*2,180*1,740	6,680*2,180*1,740	6,680*2,180*1,740
Weight	Net : 10,000kg Gross : 11,800kg	Net : 10,000kg Gross : 11,800kg	Net : 10,000kg Gross : 11,800kg	Net : 10,000kg Gross : 11,800kg
Packing Size	31M3	31M3	31M3	31M3

Pitch	MSA14-25	MSA14-30	MSA18-20	MSA18-25
Number of shuttles	252	312	212	252
Diameter of bobbin	250mm	250mm	250mm	250mm
Applicable twine range				
Nylon Mono (Bobbin capa)	0.37～0.70 (220g)	0.37～0.70 (220g)	0.40～0.90 (280g)	0.40～0.90 (280g)
Nylon Multi (Bobbin capa)	210/9～210/60 (190g)	210/9～210/60 (190g)	210/12～210/90 (220g)	210/12～210/90 (220g)
PE twine (Bobbin capa)	380/6～380/30 (158g)	380/6～380/30 (158g)	380/9～380/45 (183g)	380/9～380/45 (183g)
PE Braided	-	-	0.5～2.0	0.5～2.0
Mesh range (knot to knot)	11mm～150mm	11mm～150mm	14mm～150mm	14mm～150mm
Looming speed	22RPM	22RPM	22RPM	22RPM
Knot configuration	SINGLE/DOUBLE	SINGLE/DOUBLE	SINGLE/DOUBLE	SINGLE/DOUBLE
Type of upper hook				
Main motor	3.7kw＊1	3.7kw＊1	3.7kw＊1	3.7kw＊1
Mesh forwarding motor				
Dimensions	6,680*2,180*1,740	6,680*2,180*1,740	6,680*2,180*1,740	6,680*2,180*1,740
Weight	Net : 6,000kg Gross : 7,200kg	Net : 10,000kg Gross : 11,800kg	Net : 6,000kg Gross : 7,200kg	Net : 10,000kg Gross : 11,800kg
Packing Size	16.7M3	31M3	16.7M3	31M3

H29.3.22

Note: 1) Looming speed varies in relation to mesh size and twine diameter.
2) Minimum size carries in relation to the operating speed and twine diameter.
3) All specifications are subject to change without notice.

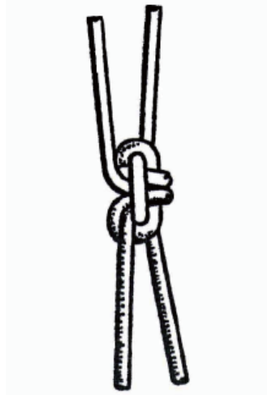
Optional equipment

Data logger system (monitoring system):

This system analyzes the accumulated data of each machine's production speed, net specifications, warp/weft tension, humidity, temperature, etc., which can be promptly utilized for improved productivity.

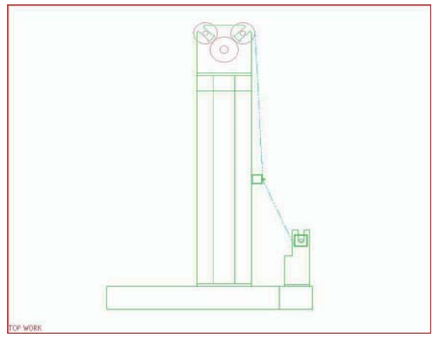
Special knots:

This device makes special custom knots which have already proven to be successful in the market.



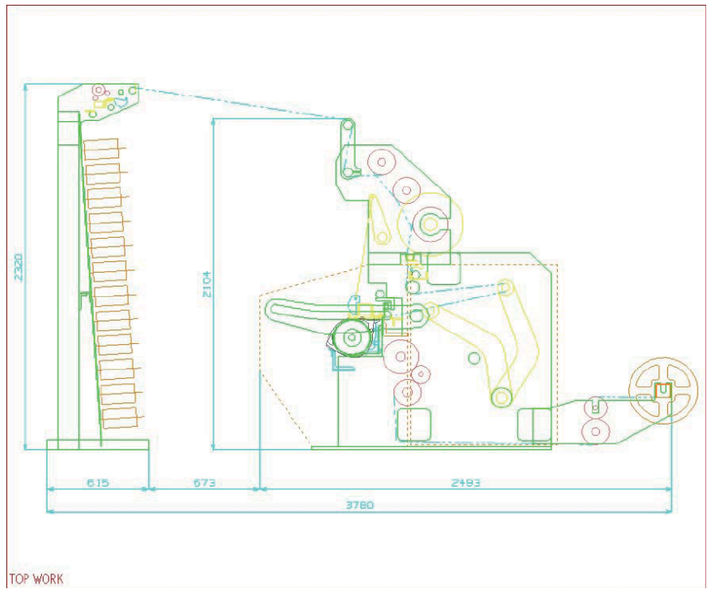
Selvage gathering device:

When netting is produced with a selvage twiner, selvages are gathered together to become compact and excess selvage twine is wound for easy handling. This device is useful for inserting a steel rod through the selvages prior to depthwise stretching.



Cross section

Cross section of Model MSA showing path of twine and netting: WARP, WEFT, NETTING.



Net winding system

Net falling down & Weinding system

Weight Roller Winding system

LOCAL ASSEMBLY AVAILABLE

When we use the term **Local Assembling** we are referring to when we ship the complete kit of the new MSA Series to the customer's factory, and the customer's technician's and workers assemble the machine according to our highly skilled technician's direct expert guidance. Therefore, **your technicians get the hands on experience and ability required so that the MSA series netting machines can be customized and specially adjusted and re-adjusted** to constantly maintain the highest net making productivity. This will also insure that your new MSA is always running at its maximum level of output thus giving our customers the maximum value for their purchase. Furthermore, local assembly is a much more cost effective way to make the machine, and thus customers can expect up to a 25-30% savings in cost when using this option.

※ B-2 winder and creel stand shall be manufactured locally according to technical drawings from AMITA.

*The painting shall be done locally.

INNOVATION

To remain leaders in the netting industry, we at Amita Machines are always striving to remain on the cutting edge of netting technology and design. As we embark into the 21st century we are looking to the future and the future needs of our customers. This is why we have designed the new MSA Series of netting machines. We have made improvements to the design to lower over cost and increase productivity.

Design suitable for Local Assembly

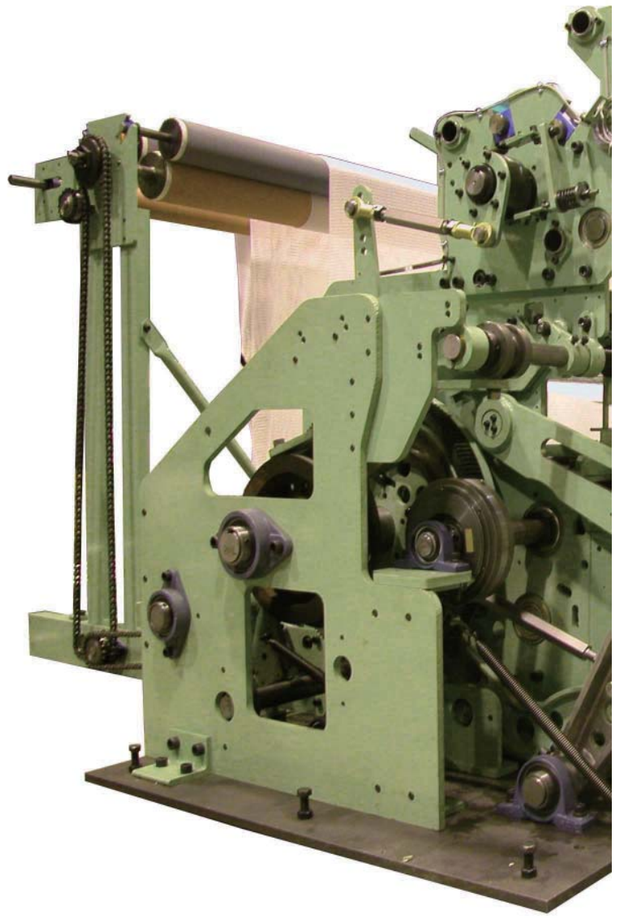
For over 20 years, Amita has been developing and improving its machining process to become more and more precise. As a result of this high precision ability, we gained much confidence with our Local Assembly service and announced its availability for our Model NSB 7-40 for a very narrow range of net machines to our customers in 1999. This trial was very well received by our customers and resulted in us selling more and 100 sets of netting machines including repeat orders within a 1.5 year period. Based on this experience, we thoroughly studied the Local assembly status and sucessfully developed the New MSA.

Easy Adjustment

- Stroke cam
- Warp rollers
- End covers
- Variable speed motor
- Gauge movement
  - mesh forwarding
  - weft supply
- Torque keeper
- Automatic stop
- Auto warp supply system
- Knot-tightening brake

Long Durability

- High level of rigid construction designed to maintain the same level of production for a minimum 5 years.



OPTIONAL DEVICES

1. Special knots **2**. Servo motor **3**. Data logger system (Monitoring System)
6. Resining system **7**. Net splitting device **8**. Large mesh making device

Optional equipment

Other options in brief

Advanced net forwarding system (servo motor):

Amita Model MSA net machines can be equipped with a Computer Numerical Control (CNC) servo motor system for the mesh forwarding device; the most important segment in deciding the net machine's performance.

After more than ten years experience in the use and improvements of this system, the current servo motor system is modified to have the specific performance required by net machines.

Amita's servo system can skillfully respond to the sophisticated development of resistant load that is characteristic with net machines. Under normal operation, it is completely trouble-free and reliable. The current system does not employ a battery nor a fan making it more durable than earlier models. Some fifty net machines employing the new OSP5-C servo system are running without any trouble in the past four years.

Major features:

Instant setting of accurate mesh size eliminates the production loss normally associated with the conventional trial runs necessary to obtain correct mesh size.
AC motor is brushless and maintenance free. Its quick response insures optimal performance.
When knitting reaches the appointed pre-set count, two or three distinct "marking" meshes, either larger or smaller than normal size, are knit automatically. Afterwards, the counter resets and begins counting again.
In the case of whole-lot bobbin change, the trail end of the weft lines are able to bypass the knot making process.

Selvage twiner:

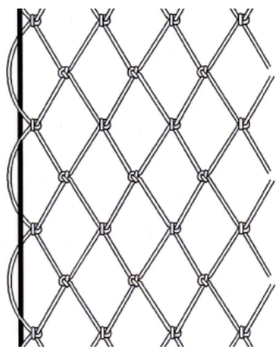
This device passes a twine through selvage meshes. This twine is used as a guide for passing a steel bar through the selvage meshes prior to stretching.

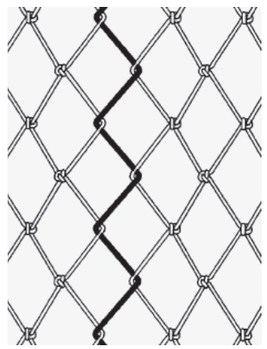
Net splitting device:

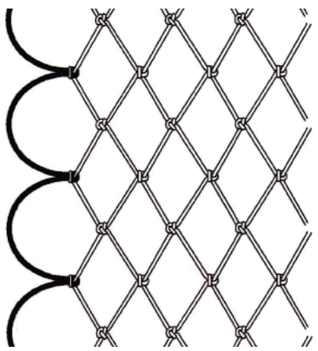
At locations where the netting sheet is to separated, knot formation is avoided by passing the warp twine through a hole in the reed that is lower than the usual holes. With this system the warp twine does not reach the upper hook to form a knot.

Large selvage mesh device:

Selvage meshes are uniformly produced slightly larger than normal mesh size. This facilitates the joining of netted sheets. Twine supply is adjustable.







Resining system:

Sheets of netting are treated with resin as they flow out of the machine, insuring that the knots remain tight and uniform prior to stretching.

Additional rollers formation:

This system copes with thicker and-higher number of selvages.

Large mesh device:

This device can produce netting of larger mesh size than is normally obtainable from the standard design of these net machines.

Temples:

Temples are placed at the mesh forwarding roller's outer edges to counteract the natural migration of the netting towards the middle of the net machine. This unique approach leads to more uniform mesh size across the entire sheet of netting.

Highlights

Control panel

The electric switches and circuits are up-to-date, modern and easy to maintain. The displays show current and total rows knit. A third readout, monitoring the net machine's looming speed, is available as an option.

Nitration treatment

At higher speed net production, normal hooks and other components wear out much more quickly. All hooks are cut from stainless steel and their surfaces have been hardened using a modern nitration treatment. Therefore, very high durability is achieved. The following parts have been specially hardened by surface treatment

upper hook
lower hook
guide hook
twine separator
stainless steel pieces of the shuttle
shuttle support

	Hardness	Thickness
Hard chrome coating	HV850~900	15 microns
Special nitration treatment	HV1,200	35 microns

Plastic shuttle

Amita now has over 20 years of experience with shuttles made from glass-fiber-reinforced nylon. The shuttle's shape has been optimized over the years. Twines pass smoothly under the shuttles without causing them to jump, resulting in quiet and efficient operation.

Bobbin

Several types of bobbins are offered allowing for greater flexibility in twine range. 150mm dia bobbin is most suitable for producing thinner netting. 170mm ϕ bobbin is greatly strengthened by increasing interior bobbin diameter from 80mm to 90 mm.

Upper hook

Specifically constructed to insure the most suitable shape and design, these stainless steel hooks with special nitration treatment insure long durability.

Lower hook

A special nitration treatment, more resistant than hard chrome, has been applied to the stainless steel (JIS SK) hooks to insure high durability.

SINGLE-KNOT NETTING MACHINE FOR NYLON MULTI-FILAMENT AND PE TWINE

One of the special features of this service is that it is geared for single-knot netting machines,especially designed for nylon multi-filament and PE twine. This is the first time that a service such as our Local Assembly has been available for such high speed machines that can run up to 27 RPM's (MSA 9-40) which separates us from our competitors.

Developments considering future demand

- Improved design to be able to cope with special knots(optional) and also, rollers formation to cope with thicker and higher number of selvages for Japanese use (optional)
- Improved design to be able to cope with Automatic and Labor saving
  - a) Servo-system (Optional)
  - b) Automatic Bobbin Winding Machine (Optional)
  - c) Monitering System (Optional)
  - d) Whole-lot Bobbin Changing System (Standard)
- Improved design to be able to cope with high speed by strengthening the stability of the machines and with high quality.
- Acheived high percentage of interchangeable parts between different types of machines within the product line of Model MSA series.

Model MSA 10.5-40 shown

High Productivity

- Wide mesh depth
- High speed
  - up to 24 RPM for 11-40
- Largest bobbin capacity
- Whole-lot bobbin change (standard)

Low Vibration

- Frame structure
- Lower hook support
- Lower hook frame
- Main shaft
- Base plate
- Sub frame
- Knot forming angle

4. Rollers formation to cope with thicker and higher number of selvages **5**. Selvage twiner system
9. Selvage gathering device **10.** Large selvage mesh device **11**. Temples

Enhanced productivity

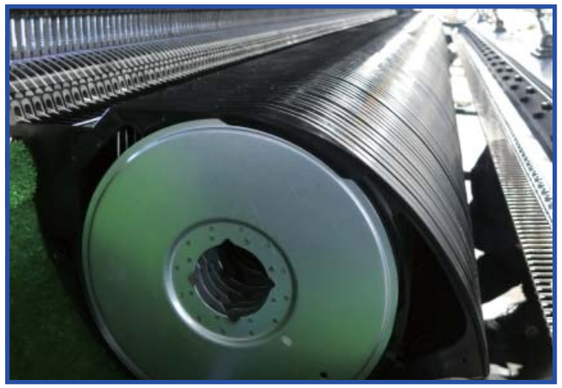
Two of the most important aspects in the operation of net machines that involve labor and time are changing depleted weft bobbins and the loading of empty bobbins with new twine. Many years ago Amita recognized these trouble spots and designed economical solutions for both. The systems described below, like our net machines, have been continually refined and are not offered by other manufactures.

Whole-lot bobbin change

Virtually anybody can operate this simple system for quickly replacing all the weft bobbins at the same time. 1 The operator first removes all the shuttles (complete with depleted weft bobbins) from the net machine. 2 They place the shuttles (complete with fully loaded weft bobbins) across the net machine. 3 They inch the net machine through its first rotation to join the new weft lines to the tail ends of the former lines. 4 Finally the operator quickly cuts off and removes the trail ends before resuming normal operation. Using this process it is possible for one operator to change all 610 shuttles in about 20 minutes.

Using our unique whole-lot bobbin changing system, all the weft bobbins are replaced at the same time. This feature drastically reduces machine down time.

There is no need to remove the weft bobbins from the shuttles during this process.

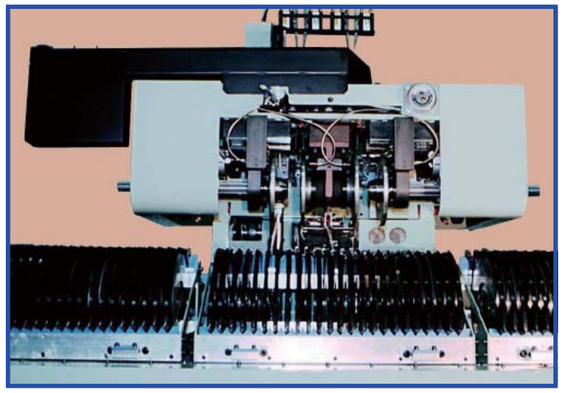


Automatic bobbin winder

Our Model AWD automatic winding machine complements the whole-lot bobbin changing system outlined above. The function of this winder is precise, yet operation is simple enough for people with little experience. Weft bobbins, still inside their shuttles, are placed in the winder's loading platform. Tie-in knots are then automatically formed by the machine's knotter, which ties knots of the same strength and quality as that of the human hand. The bobbin winding proceeds automatically without any attendance. After the entire set of shuttles is wound, the shuttles (complete with fully loaded weft bobbins) are placed on carriers and moved into position for the next whole-lot bobbin change.

Weft bobbins are wound while still inside the shuttles, therefore labor is kept to a minimum.

Model AWD automatic winding machine is shown below.

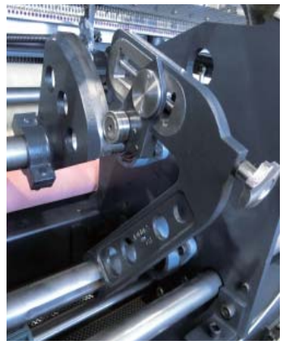


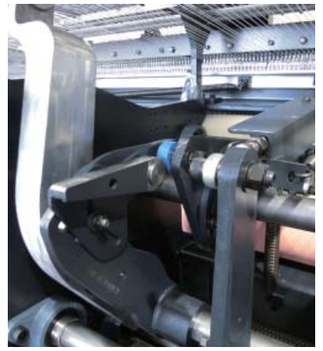
Note: extra spare parts are necessary to take advantage of these systems. Please contact your sales representative for more details.

Highlights

Knot tightening

Movement of the knot-tightening pipe is stabilized to start from a constant location. This improvement insures an even knot tightening regardless of changes in the weather, like humidity and temperature. The strength of knot -tightening can be adjusted by gauge movement.





Variable speed motor

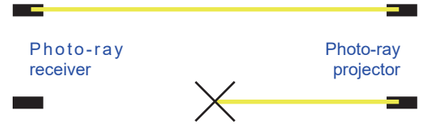
The variable speed motor, with stepless speed changer, is not only simple to operate, but also allows for any intermittent looming speed.

Automatic stop

The automatic stop function is activated when:

warp twine on the creel stand is consumed or cut
warp twine on the creel stand is too loose or too tight
weft twine in the bobbin is consumed or cut
shuttle jump
net production reaches the knot-counter setting
electric motor is over-loaded

If the infrared beam is unobstructed, the net machine functions normally.



If the infrared beam is obstructed, the net machine stops.

Gauge movement

Mesh forwarding and weft supply can be easily adjusted by gauge setting, thus enhancing and simplifying operation of the net machine.

Mesh forwarding

Weft supply

Lower hook rail

The redesigned lower hook rail is of a one-piece design and requires no adjustment. The rail is angled to facilitate the smooth release of warp twines from the lower hooks. In addition, large bearings are used to improve performance and insure consistency of the lower hook movement.

Header

A hard chrome pipe has been added to the knot forming angle to help knit fine nylon monofilament lines more smoothly and to avoid damage to the track lines.

Reed plate

To allow for high speed operation the reed angle has been lightened by using aluminum. Nonetheless, the reed plate is made of steel to insure long life and reliably.

Safety lock

When activated this feature makes it impossible to operate the net machine. This lessens the chance that the net machine will experience damage as a result of untimely operation, and is another feature geared towards protecting your operators from undue harm.

Guide hook

A double guide hook is employed to help the weft line move along the net machine more smoothly. The guide hooks have undergone a special nitration treatment for higher durability, which is especially effective when knitting very fine line.

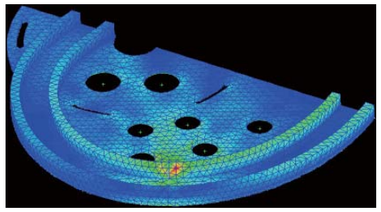
Knot tightening shaft

The diameter of the knot tightening shaft has been increased to 70 mm to insure even knot-tightening.

Cams

To resist the increased levels of stress associated with higher speeds, all the cams of our Model NBA / YSA have been made from nodular cast iron (JIS FCD500) containing spherical carbon, which is twice as strong as ordinary cast iron. Every cam is designed using the most advanced Computer Aided Design (CAD) software available to insure the optimal size and shape to minimize the driving load. Afterwards 'finite element method analysis' software is used to check the structural integrity of the components prior to production. In addition, all cam surfaces are hardened using a thermal treatment. Therefore, very high durability is achieved.

Tensile strength: 50kgf/mm^2 Hardness: more than 50 (rockwell hardness) Surface finishing: machine grinding

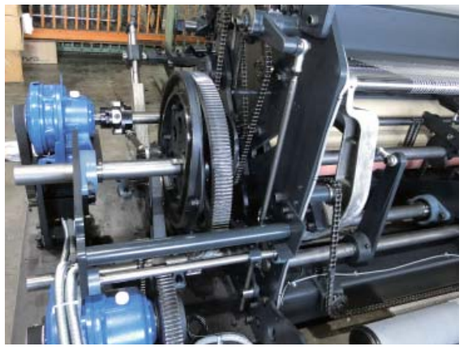


Sub frames

Three sub frames and bases are evenly spaced between the main end frames, insuring consistent rigidity and strength across the full width of the net machine. Such solid construction greatly prolongs the life of the machine's shafts, cams and other vital components.

Main Shaft

The diameter of the main shaft has been increased to 70mm to insure smoother movement and to counteract vibration. Additionally the supporting flange units, which help to prolong the main shaft's life-span, have been upgraded accordingly.



Solid construction

The stability has been greatly enhanced by the addition of a "box-shape" frame, employing a 22mm thick base and sub-frame. Furthermore, the area of the base has been enlarged as well. This greatly contributes the increaced stability of the machine.

Lower hook stroke rod

The lower hook stroke rod is made of a solid piece of steel (JIS SS400), instead of bolted pieces. The length of the new stroke rod is adjustable with turnbuckles. This new system results in a stronger stroke rod and accurate, yet simple, adjustment of the lower hook movement.

Lower hook frame

The lower hook frame is supported by middle supports. This system results in much less deflection of the frame, without increasing its weight, for smoother travel of the lower hooks. The life of the mechanism driving the lower hooks is prolonged.

The weight of the lower hook frame is significantly reduced leading to smoother movement and less vibration.

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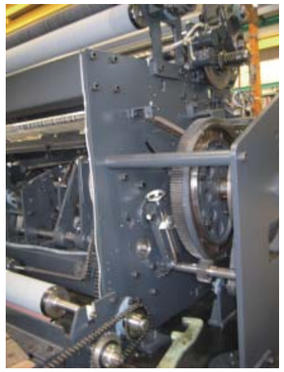
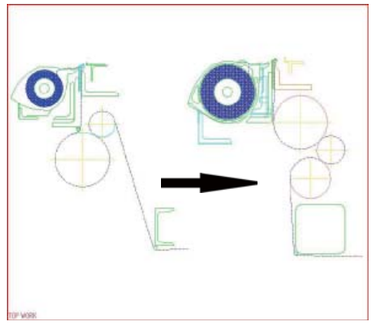
Mesh forwarding system

Changed location of mesh forwarding system to the outside of frame.



Mesh forwarding rollers

A third roller has been added to the repositioned mesh forwarding mechanism. The result of the new configuration is more stable and uniform movement of the netting. Thus improved quality is gained.



Warp supply system
Auto warp supply system

This device can correct un-even warp supply automatically. As a result, net quality and machine condition has been improved. This feature increases the net machine's overall productivity while simplifying overall operation.

Warp rollers

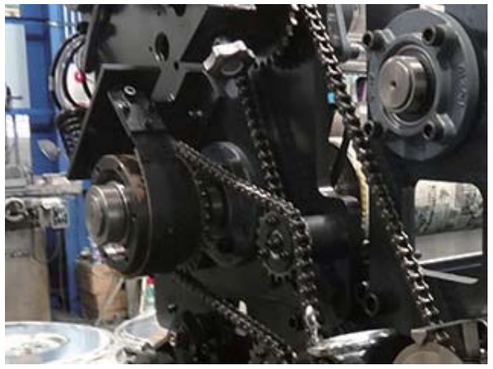
The warp rollers have been repositioned for simplified threading. The diameter of main roller has been changed from 6" to 8" and the composition of the rollers are 8", 6", 6", 4". Thus, proper tension is maintained along the entire length of the roller system.

Torque keeper

The net machine is equipped with a 'torque keeper' instead of a torque limiter. This allows for better stability and ease of making minor adjustments.

Warp cam clutch

Size is BS65.



Warp tension shutter system

Improvements were made to the warp tension springs. The system has been upgraded to a warp tension shutter system, in which are very difficult to break.

Twine separator

Redesigned so that its motion always follows a 'guide'. The stainless steel (JIS SUS304) twine separator is quiet and accurate. In the unlikely event that the twine separator fails, it retreats to the vertical position. Thus the upper hooks are not damaged when the twine separator moves towards them.

Shuttle support (for above 230 ϕ bobbin)

Improved material from Duracan to MC Nylon. Further, shuttles are supported at two additional locations for better stability in positioning. The shuttle support swings, facilitating twine passage by reducing friction.

Automatic stop for knot-tightening pipe

If the knot-tightening pipe is too tight or too loose, the machine is automatically stopped by electric sensors.