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Review On Different Type of Embroidery Machines And Softwares

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Abstract: India's embroideries market are still unexplored. Embroidery is used for ornamentation of apparel products such as lingerie, furnishings and have not used much for embroideries. If mass production is achieved by hand embroidery, the cost would be high and the quality would be unstable. Thus the researcher believes that computerized embroidery machine can be applied in contemporary fashion to develop creative embroidery in controllable and efficient manner. To conclude, by using computerized embroidery machines, not only the productivity can be higher, the design of embroidery can become more diversified and creative in material usage. Although computerized embroidery machine is one of the most promising inventions for embroidery in this century, not many people know the system or operation of the whole process, not even some fashion designers.

Keywords: Embroidery, Manual embroidery, CNC machines , Epcwin, Wings' XP, Barudan, Melco, Tagima,

1). Introduction:

Embroidery is one of the oldest methods of surface ornamentation of textile materials. Demand for garments embellished with embroideries with sequins and crystals are quite strong in the international market.

India's embroideries market are still unexplored. Basically, embroidery is used for ornamentation of apparel products such as lingerie, furnishings and have not used much for embroiderie . The domestic embroidery manufacturing is totally unorganized, with very small units situated in various parts of country **[1].** Embroidery is one of the most ancient forms of artistic expression practiced by mankind (Chung, 2005). Actually embroidery is a technique that adds value on the fabric by decoration and creates texture. Good quality embroidery can even add value to final products. Embroidery generally appears on fashion items. If mass production is achieved by hand embroidery, the cost would be high and the quality would be unstable. Thus the researcher believes that computerized embroidery machine can be applied in contemporary fashion to develop creative embroidery in controllable and efficient manner. Therefore, embroidery can be produced effectively in a controllable manner by computerized embroidery machines in fashion industry. It is a accurate and systematic process for the fashion designer to create embroidered

products which can be mass produced after the accurate planning for the embroidery process. Besides, after saving the motif data in the embroidery machines computer, the design can be embroidered again in the same manner even with the use of different materials. This facilitates the fashion design process by creating various motif samples efficiently. To conclude, by using computerized embroidery machines, not only the design of embroidery can become more diversified but also the productivity can be higher, the design of embroidery can become more diversified. It is more creative in material usage. Although computerized embroidery machine is one of the most promising inventions for embroidery in this century, not many people know the system or operation of the whole process, not even some fashion designers **[2].**

2). Methods of Embroidery:

- Hand embroidery
- Computerized embroidery

2.1) Hand Embroidery :

- Traditional sewing skills are used.
- Complicated and slower to make
- Time consuming and high cost
- Perfection depends upon workers skill
- Manual formation of patterns on fabric
- Difficult to handle
- Limit variety of designs

2.2) Computerized Machine:

The embroidery design is created on a computer using specialized software that is "Digitized". Artwork is interpreted in stitches by plotting a route that the embroidery machine needles will take when stitching the design and applying machine function like colour changes.

The complete design is transferred to embroidery machine in a specific "stitch file" format or language. When the design is saved in the memory of the embroidery machine, then the operator teaches the embroidery machine how to sew the design i.e Which needles to use for which colour and then start the machine embroidering **[3].**

3). Features of Computer Embroidery Machines:

Some of the most common features include LCD touch screen, user interface, network capability and USB connection, and internal memory that can store stitches and locations. Along with the embroidery

machines, some software are also designed to served the embroidery requirement. This break-through boosted the embroidery production and a new revolution began in the embroidery industry **[4]**.

4). Hand Versus Machine Embroidery:

4.1) Stitches:

Handmade Embroidery allows for a variety of stitches in varying thicknesses of thread, every work is unique. Machine-made embroidery is completely uniform; every piece is virtually identical to the next. Handmade Embroidery begins with stretching the fabric tightly over a wooden frame. The artists use a fine needle and colorful threads to sew each stitch by hand. Machine-made embroidery is computer generated and fabricated. Pre-made patterns are input into the computer that controls the sewing machine to make the embroidery.

4.2) Appearance:

High quality handmade silk embroidery looks alive because each artist creates it with a personal touch. A machine cannot make decisions or infuse passion into its work. In comparison, machine-made embroidery looks dull and lifeless. Each piece of handmade embroidery is unique, even when using the same pattern; artists have the discretion to vary color and stitches. You will never find two completely identical pieces; every piece is one of a kind. Machine-made embroidery is just like a print, all the copies looks exactly the same, the color, the stitches, the final product are all exactly the same.

4.3) Thread:

Pure silk thread is used to make handmade embroidery. Silk thread cannot be used in machines because it breakes too easily. Susho uses silk thread that can be divided into 16 individual stands, impossible with a machine.The thinner the thread the more detail and definition are possible making higher quality and more valuable handmade embroidery. Its machine should use thicker thread commonely polyester rayon or metallic.

4.4) Backgrounds:

The back of handmade embroidery is irregular and loose. You can see and feel the knots. Each piece of thread is no more than two feet long and so there are knots when a new piece is started or when the artist changes colors. The stitching at the back of machine-made embroidery is very tight and neat, every stitch is perfectly identical to the next. There are no knots on back of machine-made embroidery, because they don't need to change thread. Machine thread is very long; each spool is a few miles long.

4.5) Collectible Value:

Because handmade embroidery requires real workmanship and is very time consuming. It is inherently more valuable than mass produced, machine-made embroidery. Machine-made embroidery is not collectible when we compared with high quality handmade embroidery with the highest quality pieces, the value of the handmade embroidery should be estimated by experts.

5) Commonly Used Embroidery Softwares :

5.1) Wilcom :

Embroiderystudio© is ideal for Professional embroidery digitizing, Fashion design, Customization & logos, Multi-decoration design, Any vector art creation, Textile art creations. "Wilcom is by far the easiest and most intuitive to use, with many time-saving features." No need to purchase different software for different processes, Embroidery Studio *e2* has it all! With coreldraw® Graphics Suite X5 integrated into the product, take vector artwork and combine stunning print, embroidery, appliqué, sequins and now rhinestone designs. Produce professional worksheets for client approval and production. And export the file into whatever machine format you need for production. Embroiderystudio© *e1.5* is built for demanding production and provides flexible and intelligent workflows to streamline your repetitive tasks and build robust design files that stitch flawlessly. Wilcom embroiderystudio© *e1.5* also integrates with existing printing processes, enabling swift inter-conversion of print and embroidery designs, as well as endless possibilities for multi-decoration design.

Key features:

- Includes the complete coreldraw® Graphics Suite X5
- Powerful Editing
- Superior Wilcom Stitch Quality
- Built-in Intelligence power of Auto Fabric Assistance
- Creative Stitch Effects such as Contour Stitch, Color Blending, Accordion Spacing and the new Freehand Embroidery tool
- Ease & Efficiency
- Easy Multi-decoration
- Power and efficiency
- Building the future – bringing the Print and Embroidery Worlds together
- Perfect Lettering [7,8,9]

5.1) Epcwin-The High-End Software:

A unique and modular software EPCWIN developed by ZSK Stickmaschinen, EPC WIN features all program steps ranging from designing, drawing and punching up to editing. EPC WIN is a joint development of ZSK Germany's leading manufacturer of embroidery machines and gis – specialist for embroidery software. The epcwin software is Windows-based system and is compatible with most common The user is optimally supported and navigated through all work steps and can thus work quickly and efficiently. Schiffli machines, from the oldest model to the very latest electronic controlled models,Epcwin is able to handle digitizing for multi-head embroidery as well as digitizing for schiffli embroidery machines.**[7,8,9]**

A) Epcwin is supplied with the following dialog languages:-

• German
• English
• Italian
• Spanish
• Turkish
• French
• Portuguese
• Chinese (GB 2312 Simplified)
• Chinese (Big5 Traditional)
• Korean

B) System Requirements:

- To allow the program to run smoothly, the computer must satisfy the minimum requirements stated below.
- Processor- Intel Core i5 2,5 ghz Intel Core i7 3 ghz,AMD FX
- Memory (RAM)- 4 GB
- Hard disk -250 GB, 500GB, Oder 128 GB SSD
- CD-ROM for installation-24 speed > 24 speed
- Disk drive-1.44 MB, Drives connected via USB are incompatible (only DOS formats supported)
- Graphics -simple Graphics card / 1 GB Gforce- AMD Radeon fanless for silent operation
- Monitor- Resolution 22“ 1600 * 1200 Resolution 24“ 1920 * 1200
- Interfaces- USB 1.0 / USB 2.0 / USB 3.0 to connect WIBU-Dongle

- Operating system Windows XP Pro *) Windows Vista *)
- Windows 7 *) *) current service pack
- Scanner -TWAIN compatible, TWAIN compatible A3 Scanner EPSON GT 10000
- Printer Graphics-compatible color printer
- Input device -3 button mouse Wacom Digitizer Intuos4A4 with 5-button mouse and pen
- Optional–Interactive pen display, e.g. Wacom Digitizer Cintiq 18SX Network card 10/100 mbit with BNC interface for networking with EPC UNIX , Internet access, CD burner for data backup

C) Features:

- **Multi-Head Design Management**

Read and write all multi-head disk codes supported by epcwin:

- ZSK, ZSK DOS, ZSK TC
- Tajima (DST)
- Barudan FDR3/FMC
- Melco
- Fortron

- **Basic-Design (Option 1):**

- All standard drawing functions
- Line
- Parallels
- Circles
- Ellipse
- Rectangles
- Polygon
- Spiral
- Stitch direction markers with automatic clipping (program 40)

- **Multi-Head Editor (Option 2):**

- No insertion of automatic programs.
- If blocks containing reference data are inserted, these are automatically converted to stitches.
- Monogram (Pr 33): Base line and parameters can be edited; fonts cannot be changed.
- Professional Punch stitch types in the parameter set cannot be edited.

- **Multi-Head Basic-Punch (Option 3; only as an upgrade for Option 2):**

Three different basic design types are supported:

- Standard designs for multi-head embroidery machine.
- Designs with head selection.
- Designs for special machines and combination machines with different embroidery heads.

5.2) Wings' XP:

Wings' XP Pilot embroidery software has many tools that can make your life a lot easier. It has many transformation tools such as Slant, scale, Rotate. It also includes reshaping abilities that can be used inside the Node editor and finally stitch editing abilities inside the Stitch editor. All these editing tools are very easy to use and they can dramatically increase your productivity.

A) Features:

- Customizable tool color schemes and use up to 99 different thread colors.
- Change any embroidery object to venere cutwork.
- New 3D working interface.
- New transparent rulers together with rotating guidelines.
- Export the 3D realistic embroidery preview to an embroidery look image.
- Adjust the 3D Light source for perfect results.
- New "Show repeats" feature for creating continuous designs.
- New digitizing method that allows adjusting Bezier curves while digitizing.
- Use the mouse wheel on any tool and make changes quicker.
- View your designs easier by using the Auto Pan functionality of the middle.
- Mouse click.
- New spiral shape to create frill designs.
- Ability to apply Trim, Weld, Intersect functions to objects.
- Slow redraw with simulation of the machine's speed and movement.
- Ability to multiply a design in circular array with Clone, Rotate and Kaleidoscope options.
- Copy attributes (stitch type, color, special functions, object properties and transformations) from one object to the other.
- Edit nodes in 3D mode and view changes immediately on stitches.
- Transformation of nodes is automatically activated when multiple nodes are selected.
- Every object keeps a history of its transformations.
- You can create clone copies that allow you to make changes to all of them at

- Apply Envelopes on Shapes, Stitches or Directions.
- Apply curved direction stitches in step objects.
- Convert images to Photo-stitch, filled with CMYK colors automatically.
- Chenille stitch type is now available.
- Unicode fonts are supported in Pre-digitize fonts.
- New Font Creator with the ability to digitize characters automatically.
- Add special functions to any selected stitches e.g. Add sequins in any stitches you want
- Insert Symbols from any Font and automatically convert them to stitches.
- Convert any bitmap/vector graphics to stitches automatically.
- The Auto Tracer converts Bitmap to Vector graphics and then to embroidery
- Ability to fill step objects with different styles on each scan line and produce unique embroidery results.
- More fabrics have been added in different groups that automatically adjust the embroidery parameters.
- New keyboard shortcuts to increase productivity.
- Create Frill designs by using the Needle up special function inside the Style.
- Editor.
- Ability to insert double sequins for sequin mechanisms that support such feature. Support for SWF double sequins.
- Create styles with sequins.
- Multiple Frames in styles with sequins.
- Fill area with Sequins
- Preview all stitch files inside the Icon browser
- Convert object “To style”
- New stitch file formats.
- New gradient fill presets.
- Support for newer versions of .AI vector file format.

B) System Requirements:

- Windows XP(SP1)/Media Center/Tablet PC/Vista/7
- 1,5 ghz Intel or AMD 32-bit (x86) processor
- 512 MB of RAM,

- 800 MB free hard disk space
- 3D AGP accelerator with directx 9.0c, 32-bit color, and at least 128MB of RAM
- 1024 × 768 monitor resolution
- 1 Free USB port (V2.0) for USB Security key
- CD-ROM drive for software installation

6). Industrial/Commercial Embroidery Machine:

There are several different major commercial embroidery machine companies across the USA. The most well known models include:

A) Barudan:

One of the most popular brands of embroidery equipment in the world.Also one of the longest lasting brand names. Barudan has both single head and multihead embroidery machines.

B) Brother:

Very well built machine from a well known and trusted name. Brother has made both single heads and multiheads in the past but Brother now primarily has been focusing on single head industrial machines and home machines.

C) Butterfly:

Butterfly has been a player in the embroidery machine market outside the USA for over 30 years. Butterfly machines are extremely popular in Africa, Asia and India.

D)Happy:

Happy is a very solid Japanese Machine. Happy has also been around about as long as the more popular Japanese models.

E) Melco:

Melco machines are from the USA, Switzerland, and England. Melco machines are generally built very different than the Asian made machines. Melco has made both single heads and multiheads in the past but Melco now primarily has been focusing on single heads.

F) SWF:

SWF machines are built in Korea and are of higher than expected quality. These machines are a bit less expensive than Japanese machines, but just as good.

G) Tagima:

Tajima Industries Ltd of Japan is regarded as one of the most well-known and well regarded embroidery machine manufacturers in the world.

H) Toyota:

Toyota machines were made in Japan under the supervision of the AISIN company. The Toyota brand has since been purchased by Tajima. Toyota has only made signel heads and their owners generally love them.

I) ZSK:

ZSK Machine are made in Germany and bulid the way German build Machinery**.** There are not as many of them seen in the United States as compared to Asian machines but they are very popular in Europe **[11].**

7). Advantages of Computerized Over Manual Embroidery:

7.1) Advantages:-

- CNC machines can be used continuously 24 hours a day, 365 days a year and only need to be switched off for occasional maintenance.
- CNC machines are programmed with a design which can then be manufactured hundreds or even thousands of times. Each manufactured product will be exactly the same.
- Less skilled/trained people can operate CNC's unlike manual lathes/milling machines etc. which need skilled engineers.
- CNC machines can be updated by improving the software used to drive the machine.
- Training in the use of CNC's is available through the use of 'virtual software'. This is software that allows the operator to practice using the CNC machine on the screen of a computer. The software is similar to computer game.
- CNC machines can be programmed by advanced design software such as Pro/DESKTOP enabling the manufacture of products that cannot be made by manual machines, even those used by skilled designers/engineers.
- Modern design software allows the design to simulate of his/her idea. There is no need to make a prototype or a model. This saves time and money.
- One person can supervise many CNC Machines as once they are programmed they can usually be left to work by themselves. Sometimes only the cutting tools need replacing occasionally.

6.2).Disadvantages :-

- The CNC machine operator only need basic training and skills, enough to supervise several machines. In years gone by, engineer needed years of training to operate centre lathes, milling and other manually operated machines. This mean many of the old skills are been lost.
- Less workers are required to operate CNC machines compared to manually operated machines. Investment in CNC machines can lead to unemployment. CNC machines are more expensive than manually operated machines, although costs are slowly coming down.
- Many countries no longer teach pupils, students how to use manually operated lathes/ milling machines etc. Pupils/students no longer develop the detailed skills required by engineers of the past. These include mathematical and engineering skills **[5,6,7,8].**

8). Conclusion :

Different methods and softwares of producing embroidery , have their own quality, speed, efficiency, and time and design limit. Through this review paper we can judge which software and method is suitable for what kind of embroidery work according requirement and different types of embroidery softwares. We have known their working procedure, system requirement and features.

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