INTRINSIC PROPERTIES OF WAX AND APPLICATION TECHNIQUES IN BATIK PRINTING

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INTRINSIC PROPERTIES OF WAX AND

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DEDICATION

For my teachers who answered my questions with more beautiful ones.
ACKNOWLEDGEMENT

The wax application techniques that appear in this thesis are examined for their ability to permit wax to express its liquid qualities and in so doing become its most honest self. The process of discovering the uniqueness of a material and creating conditions in which it can express itself honestly, is symbolic of the teaching process in which the teacher encourages the student to uniquely express himself.

This paper reflects the influence of three of my teachers, Christine Salmon, Dale McKinney and Larry Perkins. Few educators show such insight into the human material. Knowing the three people has been the most fortunate part of my academic experience.

The splendid suggestions that Florence McKinney and Leevera Pepin gave are appreciated. Their willingness to give time to the study and their support for the idea has been invaluable.

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The wonderfully contagious excitement of Mary Frances and Frank Jay was a constant source of joy. Their creativity and professionalism in the field of drycleaning resulted in batiks with clear color and luxurious hand.
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NOTE: The illustrations are selected works by the author and have been photographed by her for this thesis.
CHAPTER I

INTRODUCTION

Mankind is a weaver who from the wrong side works on the carpet of time. The day will come when he will see the right side and understand the grandeur of the pattern he with his own hands has woven through the centuries without seeing anything but a tangle of strings.1

La Martine
Conquest of the Atlantic

The batik statement historically has been related to textiles. It is a traditional method of fabric design. However, as batiks are frequently done on paper and can be done on leather and other materials it can not be characterized exclusively as a fabric statement. The distinguishing characteristic of batik is the use of wax as a resistant to dye. Inasmuch as wax is the identifying element, it follows that batiks should capitalize upon the inherent and unique qualities of wax as a material as well as the methods of the several ways there are to apply it, including traditional and inventive means.

Purpose

The purpose of this study is (1) to examine selected known techniques of applying wax to fabric for their validity, appropriateness, and effectiveness and (2) to develop new and inventive additional methods of wax preparation and application and (3) to create batiks employing these findings.
An adjunct of this study has come about through the observation of clay-like properties of these fabrics and the fabric-like qualities of clay. The findings of these relationships appear in the Appendix.

Procedures

Initially, the author experimented with known techniques of applying wax in order to gain knowledge and skill and to create a basis from which new techniques could be developed. A description of the procedures followed in exploring the several ways of applying wax to fabric constitute the body of this thesis.

Examining known techniques provided a theater for observing some of the obvious qualities of wax. Later, exploration of these observed qualities led to other significant discoveries. Temperature changes of the wax, changes in the wax formula, the addition of water to create an emulsion are some of the alterations that were carried out to prepare the wax for application — applications that would hopefully result in wax statements that would be valid and effective yet entirely different in visual character from the cliches that have become common in the art of batik. A subsequent outcome of these experiments was an exhibition of thirty wall hangings, lamps and other items of batik as a contemporary art form.

Appendix

In addition to the research and development of wax application methods, the author became interested in a related study, that of the fabric-like qualities of clay. The point at which the fabric, when permeated with wax becomes stiff is quite like clay though the end
product loses all this rigidity. This is comparable to the point at which clay is so liquid, fluid, and has maximum plasticity for forming yet the end product, having been dried and fired becomes permanently rigid.

A brief report of the findings of this adjunct study appears in the Appendix.
Elizabeth Baity, *Man is a Weaver* (New York, 1942), title page.
CHAPTER II

WAX APPLICATION TECHNIQUES

The modern artist is living in a mechanical age and we have a mechanical means of representing objects in nature such as the camera and photograph. The modern artist is working and expressing an inner world -- in other words -- expressing energy, motion and other inner forces. (He) is working with space and time and expressing feelings rather than illustrating. My opinion is that new needs need new techniques. And the modern artists have found new ways and new means of making their statements. It seems to me that the modern painter cannot express this age, the airplane, the atom bomb, the radio, in the old forms of the Renaissance or of any other past culture. Each age finds its own technique.

The literature of batik reflects centuries of development in this art form. Much of the commentary deals with the origins and the techniques. When design is spoken about, it most usually is not related to a technique but rather is considered as the more basic language of line, color, rhythm, or that which is inspired by nature or geometry.

The author recognizes the apparent technical focus of this study but intends to make a relationship between technique, whether new or old, and the visual statement that is possible and most valid with each technique. It also is the intent of this study to draw relationships between the materials used and the visual characterization of those materials through techniques that are logical in their development and unique in their ability to provide the material with an honest voice. These are the neglected areas in the literature.
Many of the traditional techniques of batik appear to be mere substitutes for block printing, painting or a number of other media. The desire to exploit wax as a medium of expression is simply not present in the literature. The crackle effect that wax is so capable of was, for instance, considered an undesirable result and evidence of poor craftsmanship. Similarly, the early batik artists would not have considered splashing around in the wax nor permitting it to run uncontrolled along the fabric. The fluid quality of the material was consequently not evident, thereby robbing it of some part of its integrity.

Contemporary textile artists have displayed imagination, ingenuity and ability in transforming fabrics into exacting artistic presentations. By developing new techniques, exploiting old ones, and using many in combination with each other, effects have been created which have given contemporary character to the art of batik.

Researching and experimenting with the known frequently serves as a launch pad for discovering the unknown or for interpreting and defining the known in ways that seem indeed new. The chronology of this report moves from traditional techniques of wax application through contemporary methods and into exploratory and innovative methods of applying wax to fabric.

Tjanting Tool

The use of the tjanting tool is likely the most exacting technique of applying wax to fabric. The tool is a cylindrical metal vessel with a small opening at one end and a wooden handle at the other. The tool is dipped into a container of hot wax in order to fill it and hot wax
is extruded through the opening the size of which governs the width of line that can be drawn with this tool. In this way narrow lines can be drawn which are not possible with other techniques.

As soon as the tool is taken from the supply of constantly hot wax it begins to cool. Because of this the artist must work swiftly at the first touch of the tool to the cloth and gradually more slowly as the wax cools, if an even width of line is desired. However, a more liquid statement can be made if the artist speeds, slows or even stops briefly at points along the line. This has traditionally been looked upon as poor technique, however if very structured designs similar to Figures 1 and 2 are carried out with lines that are so identical from end to end, the medium loses its identity and leaves one understandably guessing as to the process. The resulting statement could easily have been painted with a brush or lined with a magic marker. And with much more ease! The characteristic of this instrument that has been frequently used is the bead of wax at the opening that accumulates when the tool is picked up from one location and set down in another. The result is a bulbous shape at each end of the line (Figures 3 and 4). When planned for, this characteristic expression of wax, the drip, can be effective. When it is not expected and not planned it can be vexing. And the variety of expressions that are possible with this single technique are many. Short parallel lines with bulbs at each end are much different in effect than long parallel lines with bulbs (Figures 5 and 6). Broken lines with bulbs and broken circles are yet other expressions. Logic is yet another aspect of this bulb-line-bulb statement. According to Paul Klee "a line is simply a dot that has moved".2
Figure 1. Tjanting Tool Used Exclusively to Apply Wax.

Figure 2. Detail Showing Variety of Widths, Suggesting Fluidity.
Figure 3. Bulbous Shape at the End of Line Drawn By Tjanting Tool.

Figure 4. Bulbous Shapes at Ends of Lines.
Figure 5. A Variety of Line/Bulb/Line Expressions.

Figure 6. Detail of Figure 5.
Another expression related to the fluidity of wax as it flows through is the line which changes direction. Change rarely takes place unnoticed and often it is a difficult, traumatic even violent event. Points of change are points of emphasis. This is true in batik as the angle in a line is made there is an involuntary pause which allows the time required for the wax to flow and cause the increase in the width of the line at the angle of change. The important aspect is, of course, that it is (1) easily achieved, a natural outgrowth of the material and (2) is distinctively a wax statement.

Brushing

Brushing has most frequently been used to fill in large spaces with wax. The technique by its nature must utilize large brushes to fill large spaces because small brushes that conceivably could draw lines (without bulbs) do not hold enough wax to make lines of any length. It is also probably true that so small a store of wax would cool completely during the short trip between the container of hot wax and the fabric.

The technique has been used to completely and evenly cover selected areas of the fabric. At times this is subsequently crackled to give evidence of the wax but the author has not noticed use of the easy and unique ability that brushes have to make brush strokes (Figures 7 and 8). Many times the brushed area remains flat and textureless when it could be much more exciting by allowing the brush to do what it alone is capable of doing.
Figure 7. Brushed on Designs.

Figure 8. Detail Showing Textured Effect of Brush Application.
Crackle

The crackle effect is entirely absent from Javanese and other traditional batiks. Contemporary artists have used it extensively with great success. It is truly a uniqueness of wax and can create wonderful textures which vary somewhat in character with the thickness of the wax and the nature of the fabric (Figures 9 and 10). Variety in the subtlety of the crackle can also be achieved through changes in the wax formula. Paraffin is a very brittle wax which gives distinct crackle which can be so prominent that the crackle covers more area than the waxed area. This is done by repeatedly crumpling the fabric and the result is wide, randomly shaped areas between the waxed portions which are not easily recognized as the familiar crackle. Gradual addition of beeswax or other very pliable waxes gradually decreases the prominence of the cracks and a formula of 100% beeswax can completely eliminate cracks (Figures 11 and 12). Interesting contrasts would be possible by positioning beeswaxed areas next to those with 100% paraffin. Additionally, the crackle effect does not need to be random and uncontrolled. Controlled crackle can be achieved by folding the fabric along straight lines or fan shaped or to combinations of these two (Figure 13).

Pouring

Pouring is one of the techniques that truly frees the wax to be itself. As children spill from the doors of school for recess, the wax molecules roll out of the cups or pans and onto the cloth making such fluid footprints as splatters, runs, drips and other random shapes
Figure 9. Example of Crackle Effect.

Figure 10. Effect Possible by Vigorous and Repeated Cracking.
Figure 11. Large Poured Areas With Crackle Eliminated.

Figure 12. Detail of Figure 11.
Figure 13. Controlled Crackle.
determined by the wax but influenced by the artist (Figures 14 and 15). However, it is not enough to turn over a pot at the edge of the cloth and expect an aesthetic language to speak profoundly. Pouring a shape or part of a bigger shape to be completed in subsequent waxings is a good way for the beginner to start. Pouring at different speeds produces effects all of which are entirely liquid. That a general plan must be present before beginning to pour is apparent -- circular, triangular, whatever is desired: a juxtaposition of contrasting colors, a collage effect, or simply producing the most liquid statement possible. A plan is imperative. Direction is needed, even though the results can not be precisely predicted. It is the essence of artist and material working as one -- that they work together. "Ballast yourself with reality and throw yourself into the sea. The sea is inspiration."

A variation of the pouring technique that can produce effects much different than those pictured in Figures 16 and 17 is the device of moving the cloth from a horizontal plane to a vertical plane. This permits the poured wax to have direction (Figures 18, 19, and 20). In addition to the vertical the fabric can be draped from a single point so that wax poured onto the fabric at that point spreads to the perimeter of the cloth. The possibilities for combinations are unlimited.

Etching

Etching is seldom mentioned in the literature though it is a valid technique. The process consists of scratching through already waxed areas to expose the cloth to dye. It produces a hard line and makes
Figure 14. Shapes Poured With Wax.

Figure 15. Shapes of Poured Wax.
Figure 16. Additional Poured Shapes With Cloth on Horizontal Plane.

Figure 17. Detail of Figure 16.
Figure 18. Designs Resulting From Pouring. White Fabric Was on Vertical Plane.

Figure 19. Detail of Figure 18.
Figure 20. Lampshade Made With Poured Decoration.
it possible to decorate or otherwise define areas that have been covered with wax. An example of this technique can be seen in Figure 21.

Sensitive use of this technique will make etching an effective addition to basic methods of application, even though it is not so expressive of wax as other techniques. The liquid quality is not present and the nature of the incised technique eliminates the possibility for crackle.

Folding and Dipping

This device is borrowed from the tye-dye method of textile design. Without resorting to repeated prints from a block a repeated design can be achieved in batik by folding a planned pattern into the cloth and dipping portions into the hot wax (Figures 22 and 23).

Spattering

This device is actually a variation of brushing and can be achieved also through a variation of the pouring. By increasing the distance between the source of the pour and the face of the fabric to about eight or nine feet, the liquid can be "dropped" onto the fabric creating a splatter with truly explosive character (Figure 24). Whereas this method of splatter has a radiant nature, a linear effect can be achieved by slinging a brush full of hot wax across the fabric.

Water Resist

While winter snow was on the ground the idea presented itself that perhaps snow applied to fabric might resist wax poured onto the fabric.
Figure 21. Etching Technique.
Figure 22. Example of Folding and Dipping.

Figure 23. Example of Folding and Dipping.
Figure 24. Example of Spattering Technique.
in patterns not possible simply by avoiding certain areas in order to free them for the next dye bath. As the snow melted and spread it was obvious that water would provide an equally effective resist. The result is poured designs that have "holes" in them making it possible for detail to be added in the interior of the "pour". The patterns produced in this manner are very close in visual effect to the shadow and light patterns made by sunlight shining through the leaves of summer trees. Previous to this discovery the author had been limited to detailing around the edges of the poured area. This technique produces areas in the interior that are free from wax and available for subsequent wax and dye applications. Figures 25 and 26 refer to this technique.

Creating an Emulsion

One of the most exciting developments of this study of batiks happened quite by accident. While refilling the bottom portion of a double boiler with water, some of the water landed in the top portion which held the hot wax serving as a reminder that all liquids are not soluble in each other. Expanding on this principle resulted in floating small quantities of wax on an expanse of hot water which made it possible to horizontally extend the fabric until it touched the surface of the water. Upon contact the fabric quickly soaks up both wax and water and the water serves as a resist to the further spread of wax. Consequently the cloth accurately records the configuration of wax droplets as they float on the water. The resultant portrayal of this phenomenon on fabric is as natural as the conditions which produced it. It is alive and uncontrived. Further, a suggestion of
Figure 25. Water Resist Technique.

Figure 26. Detail of Figure 25.
movement can be made by stirring the mixture and creating swirls of moving wax. Dropping the cloth into this activity results in beautiful frozen swirls and other suggestions of movement which are emphasized by the subtle color variations which result. Examples of this technique are found in Figures 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36.

Removing Selected Areas of Wax by Boiling Water

Whereas etching is one method of removing wax to free the cloth for additional dyes, wax can be removed with a more ameboid result by pouring boiling water on waxed areas or by dipping a waxed area of the cloth into a pot of boiling water and holding it there for a time. The result is the reverse of the color progression present in the water resist method although the configurations are similar. The character of the configurations differ however in that the ones produced by hot water have smooth, rounded edges and the ones produced by water resist have more irregular, even "fuzzy" edges.

Additional Methods

Two traditional methods of applying wax were omitted from this study because they lack the fluidity so indigenous to wax. The literature reflects a technique whereby any textured surface can be captured on cloth by laying the cloth on a raised surface and rubbing a cake of solid wax over the design. The cloth is impregnated with wax and will resist dye in the pattern of the original. Also the tjap, a metal block used for repetitive patterns, has not been mentioned probably because it did not appear to suggest the possibility for discovery that other techniques supplied.
Figure 27. Emulsion Technique

Figure 28. Detail of Emulsion Technique.
Figure 29. Wall Hanging Created Using Emulsion Technique Exclusively.

Figure 30. Detail of Figure 29.
Figure 31. Further Use of Emulsion Technique.

Figure 32. Detail of Figure 32.
Figure 33. Emulsion Technique.

Figure 34. Swirling Variation of Emulsion Technique.
Figure 35. Swirl Variation of Emulsion Technique.

Figure 36. Detail Showing Bubble-Like Quality Possible With Emulsion Technique.
There are also resists other than wax but the character of wax, natural in origin, the fragrance, and fluidity, appealed to the author in a way not possible with other synthetic materials or natural materials which required the presence of an additional catalyst.
FOOTNOTES


CHAPTER III

FINDINGS AND IMPLICATIONS

When you make a thing, a thing that is new, it is so complicated making it that it is bound to be ugly. But those that make it after you, they don't have to worry about making it. And they can make it pretty, and so everybody can like it when the others make it after you.

Picasso (as quoted by Gertrude Stein)

Findings

The recent interest in crafts should be met with viable and effective methods of execution that are expressive of the time in which they are done. Seven known techniques for applying wax to fabric were studied and suggestions for increased effectiveness were made in several instances. Three additional techniques were developed by the author and it is hoped that these will be used by persons who are looking for new ways to approach batik.

Each of these ten methods were explored for the most characteristic statement possible. A photographic record is included for illustrative purposes and reflects the complexion of a showing of batiks created as a result of this study.

A related study of clay and its surprising ability to express a fabric-like quality appears in the Appendix. A photographic presentation also accompanies this adjunct research.
Implications

The return to hand craftsmanship in the United States and in Western Europe is one of the symptoms of the great change that is taking place in our contemporary sensibility. We are confronting in this case yet another expression of the rebellion against the abstract religion of progress and the quantitative vision of man and nature. Admittedly in order to feel disillusioned by progress, people must first have undergone the experience of progress. And how can anyone fail to see where this faith in limitless progress has led? Our ruins are beginning to overshadow our construction and are threatening to bury us alive. Hence the popularity of the handcrafts is a sign of health -- like the return to Thoreau or Blake, or the rediscovery of Fourier.2

Nationally, in recent years there has been an incomplete cycle back to some of the handcrafts. "Incomplete" because the involvement seems to be a surface involvement which does not reflect a practical need for the handcrafted item but rather a psychological need to acquire and/or be "busy".

This can be, however, an important preface to the future. Currently the apparatus is being set up -- potters wheels are being moved into place, kilns are being built, looms are being bought and silk screens are being made. What is important is that the machinery is being actualized now, creating the possibility for this apparent superficiality to develop into meaningful association of man with materials. Logically what follows could be a meaningful association of man with man.

Out of the great desire to step away from the "ever-increasing production of the ever-more-perfect identical object" people have become reacquainted with the handcrafts.3 Many of these individuals are thoughtfully engaged in a return to more personal expressions of themselves through meaningful work. Paradoxically, this rebirth of
hand craftsmanship is evident where industrial concentration is heaviest -- for instance in Massachusetts, where "many young people of both sexes who are fed up with and disgusted by modern society have returned to craftwork."4

However, we also find great numbers of people running toward the handcrafts with some of the same acquisitive habits that have been developed in the era of mass production. When this occurs as a function of a recreational interest the crafts are further compromised into a means of unmindfully filling leisure time. There is little meaning in this approach to leisure activity, but through exposure to crafts, the opportunity is present for the would-be craftsman to grow regardless of the initial approach. There are lessons to be learned in discovering the nature of materials.

For I think it is reasonable to suppose, though the conjecture has never been tested, that the more skilled and elaborated leisure activity is, the more deeply satisfying it becomes. Also this more comprehensive continuing schooling may, in effect, make possible a more skilled voluntary service in the community, in the management of the environment, or in helping those in need of more teaching or guidance.5

There are other circumstances that may through force of necessity, draw man closer to the nature of materials. As materials become more costly during inflationary periods, the decision to hire skilled and specialized labor becomes more economically critical to the individual. He begins to look for alternatives. Through thoughtful consideration, some research and much inquiry, increasing numbers of individuals will discover that they can build their own addition to the house or make their own jewelry, or quilt, or design their own fabrics or clothing or repair the car, or any number of other things.
Perhaps as increasing costs make it more difficult for persons to buy completed articles they may be forced to meet their needs by production within the family unit, and in so doing move closer to an understanding of the nature of materials, and understanding of the environment, and of each other. Discoveries will be made of how nails hold wood together, how wool becomes yarn and how yarn becomes cloth, or how clay becomes a bowl or a cup. When this happens through love and understanding of the material and the need of the product rather than the recreational pleasure or cultural acquisition involved, the craftsman will understand more about the material. Because he must use what he has made, if the product fails, he must remake it with a better understanding of the material.

The utilitarian role of the handcrafts gives them a rhythm which is close to the human rhythm — a gold ring wears thin, a woven cloth shows age, a clay bowl falls from the table and is broken. "The craftsman does not seek to win a victory over time, but to become one with its flow." The crafts live and are enhanced by the uses that are found for them by the users. In this way the crafts demonstrate "that the prideful 'I' of the artist is a 'we'." The concept of timeliness is expressed by Octavio Paz in a comparison between the crafts, industrial products, and timeless works of art.

The destiny of the work of art is the air-conditioned eternity of the museum; the destiny of the industrial object is the trash barrel. The handcrafted object ordinarily escapes the museum and its glass display cases, and when it does happen to end up in one, it acquits itself honorably. But it has neither the desire to last for thousands upon thousands of years, nor is it possessed by a frantic drive to die an early death. Between the timeless time of the museum and the speeded-up time of technology, craftsmanship is the heartbeat of human time. A thing that is handmade is a useful object but also one that is beautiful; an object
that lasts a long time but also one that slowly ages away and is resigned to so doing; an object that is not unique like the work of art and can be replaced by another object that is similar but not identical. The craftsman's handiwork teaches us to die and hence teaches us to live. 8

What has been so frequently forgotten in the recent past is the importance of the process as opposed to the product. A cultural snobbery has developed recently related to the handcrafts. A degree of prestige accompanies each handcrafted acquisition. The product is displayed rather than used, deified rather than appreciated. The pitcher that is exhibited in this way will never be asked to prove whether or not it pours well or drips badly. The process is incomplete.

There are at least two sides to the craft process -- that which precedes the final product and that which follows it. The emphasis of this paper has been on the process of creating the product, the opportunity for the craftsman to grow through his intimacy with his craft. However, once the product is finished the process must be continued by the user. The continued growth of the designer-craftsman depends upon this. In this way the process is completed and the loss of either part is early death for the handcrafted item.

The kind of sensitivity that will allow the process and the product to be perceived as one is important to the validity and the vitality of the society. The crafts have too long been relegated to objects of cultural acquisition or time filling pastimes. Handcrafts have a higher assignment -- to be used, and until the handcrafted work is viewed as an object of greater beauty because of its use it will fall short of its potential.

A move toward a more intimate association with materials and the resulting closeness with the environment can serve as a prelude to
association of persons with each other. The understanding of materials is symbolic of this intimacy of men with each other. Working with materials is an exercise in other-directedness -- one must discover what the material wants to do and minimize personal desires. Similarly, the great hope is clearly for men to understand each other.
FOOTNOTES


3 Ibid, p. 51.


7 Ibid, p. 51.

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APPENDIX

THE FABRIC QUALITIES OF CLAY

The important thing about snow is that it is white. It is cold, and light, it falls softly out of the sky, it is bright, and the shape of tiny stars, and crystals. It is always cold. And it melts. But the important thing about snow is that it is white.

The important thing about clay is that it is plastic and its plasticity allows it to take many forms. Firing makes rigid the form which serves as a reminder of what once was possible.

Clay has traditionally occupied a utilitarian role providing jugs and vessels for some and archeologic records for others. To the author it seemed that clay might have a fabric quality similar to the drapeable quality of fabric. A study of the relationship between clay and fabric seemed to be suggested.

Fabric has also occupied a utilitarian role. Frequently though it has transcended its intended use and beautifully added to the aesthetic dimension. A plain woven, one-color fabric has a quality of depth. Shadow and color changes make simple goods sumptuous and appealing.

Can clay have this same quality and dare it do so without losing its identity?

The photographs that follow show clay in forms characteristic of fabric. Figures 37, 38, 39, 40, 41, 42, 43, 44, and 45. These expressions were produced by rolling very thin slabs of clay and draping or
forming them in configurations approximating hankies and ribbons. In some cases cheesecloth was used as a texture to suggest warp and woof. Lace was used to decorate the surface of several "ribbons". All were glazed white and to one "handkerchief" was added a border of cotton eyelet embroidery.

Figure 46 shows a more abstract yet definitely ribbon-like configuration which is possible with clay. Figure 47 shows clay in a form reminiscent of some of the line/bulb/line statements possible with wax.

The following is a photographic record of the study of clay and its fabric-like qualities.
Figure 37. Ribbons Created From Clay. Lace Used to Imprint the Decorative Pattern.
Figure 38. "Lace" Ribbon.

Figure 39. "Lace" Ribbon.
Figure 40. Ribbon of Clay. Pattern Imprinted With Burlap.

Figure 41. An Additional Ribbon Configuration.
Figure 42. Clay Napkin - Cheesecloth Was Used to Imprint the Pattern.
Figure 44. Clay Napkin.
Figure 45. Clay Handkerchief With Cotton Eyelet Lace Glued to the Perimeter.
Figure 46. More Abstract Ribbon Statement.

Figure 47. Clay Reminiscent of Line Bulb Statement of Batiks.
FOOTNOTES

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