

Inadan

THE MASTERY
OF TOUAREG ARTISANS



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Introduction

This book is a love story. A love story with the makers, their tools, their culture, and a vast knowledge that transforms matter into beautiful pieces of art. As a jeweler, I have been working and learning from Touareg jewelers for the last twenty-five years. I started in Mali in 1996 where I sat and watched Touareg artisans working in camps in and around Bamako for a couple years. Since my time in Mali, I've met, befriended, watched, worked with, and learned from Touareg jewelers in Niger, Burkina Faso, Guinea, Benin and Senegal.

Being a Touareg artisan is a lot more than knowing one trade. It is a social group and a way of life. It is taking one's place in a large and ancient family. Being an Inadan is truly in the artisans' DNA; you are born one. Of course, there are exceptions where someone from another social group becomes an artisan, or an Inadan takes on another profession.

Before being officially trained, young girls and boys become familiar with a trade because they grow up watching their mothers and fathers, aunts and uncles, sisters and brothers, grandparents and cousins working at their crafts. Every movement and technique is registered early in life.

Women Inadan, called Tinadan, specialize in leatherwork and weaving. The men specialize in blacksmithing, woodworking, stone carving, and jewelrymaking. The "official" training starts anywhere between the ages of eight and thirteen, though most children have been observing the work for years by then. It is common that young girls and boys will first start with their mother or father, then move on to learn from a relative.

Some Inadan specialize in one trade, for instance jewelrymaking or woodworking, but more often, they learn many different trades. This is what makes them such versatile artisans. For instance, a young boy might start by making wooden objects such as spoons, ladles, mortars, and pestles, then move on to jewelrymaking. It is common for artisans to learn some blacksmithing which enables them to make their own tools. Because they learn so many trades, these artisans are able to combine their skills to create masterpieces such as a *tamzak* (camel saddle) or a *takoba* (sword), examples of which can be seen in the following pages.

Sometimes the trade a person learns depends on the region or village they are from. Some places specialize in one particular trade; some villages, for example, are mostly known for soapstone carving or wood carving.

This early-age training and range of knowledge in trades make the Inadan remarkable artists and technicians. They have a unique sense of design and artistry, using patterns and symbols drawn from their natural surroundings and their history. Their technical knowledge and ability to transform raw materials into beautiful objects is simply spectacular.

There is something magical in watching someone doing what they know best. The whole process of making an object such as a piece of jewelry is like a perfectly executed choreography. Every movement is calculated; a sequence of well determined steps. There is never a hammer blow or a file stroke that is not intentional or useful.

It is extraordinary to witness the control with which the Inadan move metal in the process of forging. Barely any force is applied. Rather, it is the movement that moves the metal and not the force. It is the knowledge and the efficiency of the tool that moves the metal, not the force. It is the position of the jeweler with respect to the piece that moves the metal, not the force. It is knowing when to anneal the metal that moves the metal. It is years of training and repeating the same movements over and over that makes the metal move.

The purpose of this book is to preserve ancestral techniques, celebrating the mastery of Inadan artisans and their ability to transform metal, wood, stone, and leather into beautiful artifacts. The objects featured in this book are traditional and the designs are the property of the Inadan. The incentive and intention of sharing them here is to learn and understand the depth of the work that goes into every piece, to record the workmanship for future generations of Inadan and also to inspire artists through these extraordinary techniques.

Artifacts can be timeless, but the techniques used to make them can be ephemeral. Conflicts, socio-political instability, natural disasters and pandemics have direct impact on the old ways of doing things—techniques vanish. Natural evolution in new generations and the pressures of modern life have threatened the transmission of some ancestral techniques. For example, during the Covid-19 pandemic, the world paused, the tourism economy collapsed in West Africa, and many Touareg artisans, left with no income, were forced to find new ways to earn money. Some went to look for gold in neighboring countries, and when this became more viable, they stayed on, reducing the ability to transmit their knowledge to future generations.



Mohamed Moussa:

“The book we are making is very important for young artisans. Many techniques of our grandparents are disappearing. I personally love the idea of being able to see how some pieces are made. I never saw how the turban tcherot was made. I also never made a camel saddle. Of course, as a young boy, I saw my father doing it but I didn’t take it in. Because of this book, I will be able to see him at work through the pictures, and maybe one day I will make one. His knowledge will now live forever and many people will be able to appreciate his art.”

Mohamed Adjidar Hada:

“This shows our way of working and our art to the world. It will keep in archive the objects and the tools used to make them because these traditions have a tendency to vanish. Today, with everything that is going on, it is getting harder to be a jeweler and to make a living at it. To have friends and family members to be part of the book is a great pride. I take the pictures thinking that they will be useful for future generations of Touareg artisans.”

As you will see, in this book we use Tamashek names for each of the pieces. Tamashek is a Berber macro-language spoken in Algeria, Mali, Niger, and Burkina Faso. The alphabet as well as the writing and the pronunciation vary depending the country and region, and even between the towns and villages. It is important for us to use the real names of the artifacts. Writing them exactly as the artisan who made them wrote it. Keep in mind that the names of these objects could vary and be written differently by others.

How This Book Came to Be

During the Covid-19 pandemic, I was moved to write a book on Touareg jewelry techniques. I thought that, after many years of traveling in Africa and working with Touareg jewelers, I would have enough material for a book. I searched my hard drives and looked through thousands of images and videos made on dozens of trips to Africa and quickly realized that to do something worthy of the them and their craft I didn't have nearly enough. At that time, I thought that, as with my previous two books, I would do the research, writing and photography myself. This is definitely not what happened.

I called friends in Senegal to see how we could move forward with this idea. I talked to Mohamed Moussa, a talented jeweler from Tchindouane, Niger, who was living in Dakar. I also spoke with my friend Bamba Kasse, a Senegalese jeweler from Thies, also living in Dakar.



Bamba Kassé photographing Mohamed Moussa.



Mohamed Amoumoune photographing Eghawel Douga.

We spoke about the idea for the book and decided that Mohamed would make jewelry pieces and Bamba would take pictures of the process. In a sense, it was perfect timing for everyone—because of the pandemic, no one had work and everyone had more time.

The first step was for Bamba to acquire a smartphone with a high resolution camera. We then talked about the kind of images needed for the book, what angles to use, when to do a close-up, and the kind of shots it would be nice to have. I sent him examples of images that I thought I was looking for. Mohamed and Bamba started on a few projects and began to send photos to me.

Around the same time, Eghawel Douga and Mohamed Amoumoune and I talked about the project. They had just returned to their respective homes,



Mohamed Moussa

Tchintaborak and Agadez in Niger, from Senegal where they had been working. Both of them were immediately enthusiastic about the idea and eager to help. Again we found ways for the both of them to acquire smartphones with high resolution cameras.

They organized workshop demonstrations with friends and family members. This is the moment when things started to shift in a beautiful and unexpected way. Everyone involved pushed the project much further than I could have ever imagined. Mohamed started to take pictures of his mother, Azara Agak, as she made a leather cushion. This is what sparked the idea of expanding the book to include all forms of craft.

Every morning, I awoke to an abundance of images sent from Bamba, Eghawel and Mohamed on WhatsApp. What a treat! After a few weeks of work, I realized that the images were all too small for publication; my bad! We then found a way to send high resolution images and started over.

Mohamed Moussa, still working in Senegal, thought that artisans from his village back in Niger should be involved in the project. He put me in contact with his mentor, Mohamed Bachoka, as well as his friend Hamad-Moussa Houdoudou, a jeweler/photographer. They started on a few projects, and the book grew in size and diversity. Bachoka made a tea pot, a knife, and a sword; Hamed-Moussa took the pictures.



Mohamed Bachoka and Hamed-Moussa Houdoudou



Aminoutou Moussa

It is humbling to be around so much talent, to have the privilege of meeting and working with so many amazing artists and their families. Even though I haven't met most of the artists in person, because of their commitment, the way they were able to interact and work with the artisans as well as their personal relationships with the makers, when I look at these images, I feel like I am sitting in the workshop with them. The Touareg photographers were able to bring life into every image as I believe no one else could have done.

This book is dedicated to the artisans who made this book possible, many of whom you will meet in the following pages, and to all of the people who ignited this love and passion. Every artisan I met through the years played a part in this book directly or indirectly. It is their generosity, their talent, their friendship, and their willingness to share their knowledge that is the essence of this research. This book is truly an intimate relationship between family members and friends, and it has seen the light because of that bond.

M.C.

Teneghelt ta n Ferwan– Iferouane Cross

with Ghabda Oummama, aka Kammo



Ghana, Cameroon and Nigeria, have a long history in the lost wax technique, and it is likely that is where the Touareg Inadan learned. Objects made in this way are named after the technique (teneghelt) but over time, influenced by French colonization, the convention for naming this family of objects evolved to become “crosses.”

The origins of these traditional ornaments are uncertain, and while researchers and scholars have offered many different theories, for the moment none of them is unanimously agreed upon. One hypothesis is that the Agadez Cross, one of the oldest (along with Zinder, Iferouane, Tahoua and Timia) of the twenty-one existing crosses, is a representation of the Southern Cross (aka *Cruce*) a constellation of the southern sky that can be seen in the Sahara few months each year. It is said that these stars helped caravans find their way back to Agadez. Another theory is that the cross symbolizes the four cardinal points of a compass. The crosses are mostly worn by women on a leather thong or fabric string that goes through the center hole. It is not uncommon to see several crosses together on the same string.

Ghabda Oummama, known by everyone as Kammo, is a jeweler born in Azel, a village in the Agadez region of Niger. After many years in the capitol city Niamey, he now lives and works in Agadez. Like most Touareg jewelers, Kammo has an extensive range of knowledge, but now he specializes in *teneghelt*, the technique of lost wax casting.

He is well known for making *Tenegelt ta n Ferwan*, the Iferouane Cross. Iferouane is an oasis town and commune in Northern Niger about 150 miles south of Agadez.



The lost wax casting technique consists of three phases: model, mold and casting. The first step is to make a model from beeswax. The model is the exact size and shape of the desired end product. The second step is to encase the model inside a material that is soft enough to capture every detail of the model but also strong enough to withstand the high temperatures of molten metal. In this case the mold will be made of reinforced earthen clay.

The casting step begins by removing the model by melting the wax. The mold is heated to further clean the mold cavity, then metal is melted and poured into the mold where it hardens almost instantly. The mold is then broken open and the metal object is retrieved.

Beeswax is not common in the Sahara so it is imported, often coming from Nigeria. The wax is recycled during the casting process so a block can last a long time. Kammo starts by heating a piece over hot coals to soften so it will be easier to shape.

The first step is to create a rough shape of the cross which is then tapped with a hammer to create a perfectly flat surface. To prevent the wax from sticking to the anvil or hammer, the tools are splashed with water. For the next step, Kammo uses a knife made by forging the tip of a steel rod. The blade is very thin and cuts like a scalpel. As work progresses, the wax is periodically set in a bowl of water to make it stiffer and therefore easier to carve. Using the knife, Kammo refines the shape of the cross before dropping it back in the water.

After a few minutes in the water, the wax is hard enough to continue the carving process. Kammo cuts a small circle through what is the top part of the cross, then enlarges it to the desired diameter. He rolls a piece of wax into a rod that he hammers into a flat sheet, again wetting the tools to prevent them from sticking. Kammo cuts two pieces of this sheet that



After softening the wax, Kammo created the general shape of the cross in his fingers.



He then cuts the precise outline with a blade and adds horizontal bars. Additional work is seen floating in his bowl of water.



The center hole is cut and cones are added to three points. Note the wax rod at the top (sprue) which is where metal will enter the mold.



Pieces are fused together by touching them with a blade heated over a charcoal brazier.

he lays across the model just below the hole. As wax pieces are added, they are fused in place by touching the joint with the knife blade that has been warmed over the coals.

Kammo next forms three small wax cones between the tips of his fingers and makes a hole in the base of each cones so

they fit on the three points of the bottom part of the cross. Again he fuses them in place by touching the connection with his heated blade. A wax rod is set on the top triangular fin ("ear") at the top of the cross. This addition, called the gate, provides a spout where the wax will flow out and where the molten metal will enter.



At every step in the process, Kammo closely examines the model for symmetry.



A mixture of sand, clay, and fibers is pressed gently around the model.



This roll of clay will be shaped into a funnel that will guide molten metal into the mold.



The funnel where the wax will drip out and later the molten metal will be poured in.



A ball of the same clay mixture is used to make a small cup called a crucible.



The finished crucible where the silver will be melted and then poured.

To make the mold, Kammo uses a mixture of fine clay, sand and donkey dung. The donkey dung offers natural fibers that have been broken down to the perfect size through the animal's digestive process. The fibers prevent the mold from cracking as it dries.

Kammo begins by pressing clay into the center hole, then around around the ears and the three points. The next step is to flatten a ball of the clay into a flat sheet, about a quarter-inch thick which he wraps around the entire cross. More clay is rolled into a thick rod that is added

to the top. Kammo shapes this into a funnel, making sure that the tip of the wax is showing inside the center of it. The mold is set aside to dry, and Kammo takes up another handful of clay to create a crucible. He makes a ball by rolling the clay in the palms of his hands then makes a hole in



Kammo's workshop, set on the side of his house. Two others artisans share his work space.

the center of the ball with his thumb. By pressing all around the sides, he opens it up into a small cup; he pinches the edges to form a pouring spout. The crucible is set to dry next to the mold of the cross. It is best to let the clay mixture dry slowly, rather than directly in the sun. Slow drying prevents the mold and the crucible from cracking.

It takes a day for the clay to dry properly. When he is confident that there is no moisture left in the mold, Kammo sets it onto the coals in his fire pit to melt the wax. When he sees it bubbling, Kammo pours the wax into a bowl of water so it can be used again. He lets the mold cool, then checks for cracks that he will repair with more clay as needed.



The mold is set onto hot coals to burn out the wax. Most will be poured out and reused.



To remove the small amount of wax residue lining the interior cavity, the mold is placed back on the coals and taken to a higher heat. The crucible filled with silver is sitting nearby.



The mold is brought to a high heat by working the sheepskin bellows.



Kammo steadies the crucible against a wooden rod and pours molten silver into the mold.



The hot mold is dropped into water and broken apart with a few blows of a hammer.

He adds more charcoal to the fire and uses the bellows to bring the fire to high heat. The crucible is filled with silver, set on the hot coals, and covered with more coals. The mold is also set on the coals to burn out remaining wax residue and so it will be hot when the silver is poured in. When the metal is melted, typically less than 10 minutes, Kammo sets the hot mold, funnel up, in a pile of sand near the fire. He carefully clutches the glowing crucible with tongs and pours the molten silver into the mold.

Kammo lets the silver cool down for a few minutes before putting the mold in water. As soon as the mold touches the water, it breaks. With a couple hits from an hammer, it breaks open revealing an Iferouane silver cross. The surface of the cross bears the texture of the clay mixture so Kammo starts the process of cleaning and refining it.



Kammo closely examines the casting to be certain every detail has been captured. Now he can turn to refining the shape and decorating the surface with stamps and engraving.



The casting as it appears when the mold is broken away. The sprue at the top what will cut off.



Kammo forges each of the cones against the edge of his anvil.



The cross is examined again after the cones have been forged and filed.



As is often the case, sanding is done by a young apprentice, often a relative.



Using a graver made from a small screwdriver, the surface is engraved with traditional patterns.



He forges each of the three cones against the side of his anvil before filing them with a half round file to make them concave. Next, he forges the flat surfaces of the cross on a small stake set in the corner of his anvil. The goal is that the center portion can be struck with the hammer without accidentally flattening the cones. Next begins the long process of filing all of the surfaces, checking frequently for perfect symmetry.

The three ears of the cross are decorated by filing notches that create a triangular pattern. Now using needle files, Kammo makes sure every part of the

cross is shaped to his liking before handing it to his apprentice for sanding.

The final steps of making a teneghelt is engraving and stamping. Kammo engraves patterns that have been used by at least several generations of jewelers. He starts by drawing his graver toward himself which creates a sharp thin line that will guide his engraving. The cross bar beneath the hole is decorated with file marks. Elsewhere he stamps small circles that are called “eyes of chameleon.” Three chameleon eyes together appear at several places around the cross and represent the track of a jackal.





In addition to engraving, Iferouane Crosses usually also include stamped decorations.



Kammo examines the final piece.



These three Iferouane crosses have almost identical engraving and stamping even though they have been made of different generations of jewelers.

Assayar – Veil Weight

with Ghoumour Sidi Mohamed (Omar)



Tchimo Amoumoune is showing how to wear an assayar.

Women in West Africa often use their scarf or veil to carry house keys or money. The valuables are held in a corner of the fabric which is closed by a knot. If they do not wear a veil, they do the same with a corner of their *pagne* (colorful fabric rapped around the waist that goes down to the ankles) or *boubou* (a loose full length flowing garment).

In the next chapter, you can see a traditional Touareg lock and the set of metal pieces that are the keys. In the old days, the keys were much larger than today. Touareg women used to attach a key to a corner of their veil that they would pass over their left shoulder, allowing the key to hang down their back. This was a way to keep the key with them at all times and to show their wealth. A further benefit of this system was that the keys provided a weight that would hold the head scarf from flying in the wind. In time, the keys evolved into an ornament that has the look of the old keys, though sometimes larger and always decorated with metals of different colors. In French, “*clé de voile*” means *veil key* but it is known as a *veil weight* in English.



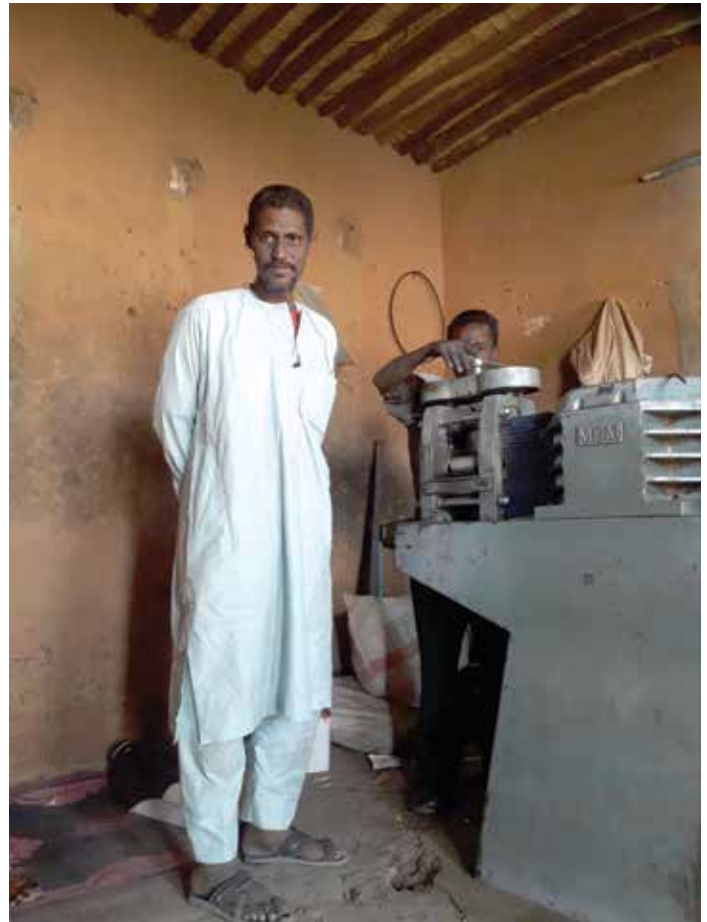
Templates passed down to Omar from his father and grandfather.

Omar is a specialist at making assayar. He is also one of the rare artisans who still makes the traditional locks, a trade that has been in his family for generations. Assayar come in many different shapes, usually made of a nickel alloy or brass and decorated with pieces of other metals to offer contrast and volume.



The first step in the process is to create sheet metal by pouring ingots. Omar travels to a shop with an electric rolling mill and uses an ingot mold created by the owner of the shop. Because the fit of the two parts of the mold isn't perfect, clay is pressed on the sides to prevent molten metal from escaping through the cracks. The mold is then set onto coals to dry the clay and heat the steel. A little motor oil is poured into the mold to help the molten metal flow inside the cavity. Omar will be making two assayars, one of a nickel alloy repurposed from old spoons, and one using brass, which is often recycled from ammunition casings. The molten brass is poured into the ingot mold. The metal hardens immediately so the clay can be removed and the mold opened to reveal a perfect ingot.

Traditionally, ingots like these would be forged into thinner sheets by hand, a strenuous and time-consuming task for metals like brass and nickel. For these pieces, Omar will use a rolling mill to reduce the thickness of both sheets to about 1.2 mm.



Omar stands beside the electric rolling mill, an expensive machine available to all artisans for a fee based on the weight of the metal being rolled. In this case, he paid less than a dollar to convert the thick ingots to sheet metal.



To create the patterns, Omar uses templates that were passed from his grandfather to his father and then down to him. He clamps a template onto the sheet and traces the outline and interior openings. As a matter of efficiency, he will make two different veil weights at the same time.

The first assayar, made in brass, includes an Agadez Cross in the top circle. To cut and pierce the metals, he uses two straight chisels, short and long, and a couple curved chisels. In the first pass, he goes over the traced lines but does not cut all the way through because this would damage the chisels and the anvil. Jewelers are careful to avoid marking their anvils because every mark will transfer to the piece being worked on. He uses shears to cut some of the outside shapes.

The second weight is made of a nickel alloy often called “black silver” because the metal appears black throughout the process due to oxidation. After sanding the final finish will be a silver color.

To remove interior sections of the design, Omar goes over the chisel cuts again, this time resting the sheet on the top of a

bolt which allows him to cut through the metal without damaging his anvil or his chisels. The sheet bends during the chiseling process so Omar pauses periodically to flatten it by hammering.

Using a few different file shapes, Omar cleans off the chisel marks and refines the profile of the assayar. It takes him several hours of meticulous filing to obtain the perfect delicate result.

Small holes are made around the perimeter of the piece where ornamental copper spheres will be riveted. To pierce holes, Omar drives punches of different diameters through the sheet as it sits on a block of lead. The holes are then filed to the desired diameter. On the assayar made of nickel, Omar has left a strip of metal on the top circle that he rolls around a mandrel into a tube. A U-shaped ring will be riveted here, providing the attachment for a scarf.

Traditionally, assayars were decorated by adding strips of other metals. This offers a sense of dimension as well as a contrast of colors. The nickel assayar will be decorated with brass and copper and the brass assayar with copper and nickel.

Scoring, chiseling and filing to refine the design.



Omar forges rods of copper into a narrow sheet and then forms the strip into a circle by hammering it on the edge over a section of steel pipe. The strips of copper, nickel and brass are placed on the assayar, and held in place with a steel clip so they don't move during soldering.



Using a butane torch, Omar solders all of the added pieces with tin solder, first brushing the joints with flux that allows the solder to flow properly. When the metal reaches the correct temperature, he touches a piece of solder wire onto each piece and the solder flows into the joint. The assayars are cleaned in acid (harvested from a car battery) to remove the flux and oxidation. The pieces are file again, smoothing and perfecting every side, curve and corner. He uses a scraper made from a discarded file to remove extra tin solder that ran in undesired places. The two assayars are sanded to remove the last scratches left by filing.



Omar's son, Houdane, does the engraving, always under the loving eyes of his father. The teaching never stops. Omar is always giving Houdane advice and direction.



Embellishment on the nickel assayar includes copper spheres that will be riveted in place after the soldering, sanding, and engraving has been done.

The first step is to forge a taper at the end of a thick copper bar. The taper is cut off with a chisel, leaving about a quarter inch section of the rod at the end of it. Omar folded a thin sheet of steel to make a tube that he uses as a handle to hold the copper pieces during forging and sanding.

With the taper part inside the tube, leaving the small piece of rod sticking out at the end of it, the little block of copper is set on the edge of the anvil and transformed into a ball by forging it. Omar then files the spheres to remove any hammer marks or facets left from forging. The taper parts are cut off leaving a little piece of wire that will go through the holes on the assayar. To attach the copper spheres to the piece, Omar sets

the sphere on a block of lead and forms a rivet in the back of the assayar by upsetting the protruding piece of wire with an hammer. The wire becomes wider and cannot go through the hole. The balls are set in place. Omar also rivets a nickel loop that will be used to attach the veil to the assayar.



Omar forges a copper rod into a loop that will be used in a leather decoration that will be added on top of one of the assayar. Aminatou Ghabdoulah specializes in making leather decorated key chains or assayar leather attachments.

This beautiful leather ornament is a meticulous process of many steps. Aminatou first dyes strips of leather in red, turquoise and yellow. She cuts them to the desired shapes that fit with the metal parts. Aminatou wraps the leather around the assayar and the copper loop and glues it in the back. She adds layers of different colored leather, some with cut outs so one can see the color that is underneath and others with embroidered patterns.

Every added piece of leather is glued and then sewn. Aminatou adds decorations by sewing patterns with strips of white plastic cut from recycled plastic bags. She adds pieces of colored wool yarn on the sides.

Aminatou Ghabdoulah holding the assayar.